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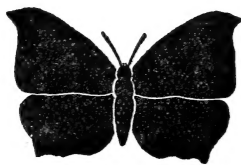
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INDEX

CONTRIBUTORS

Addison, Rev. W. R. F., 50
 Aldridge, R. V., 20
 Almy, V. C. P., 84
 Ashwell, D. A., 2
 Austin, N. J., 62
 Bain, Miss P. C., 53
 Beaufoy, L. S., 66
 Binning, H. G., 4
 Blair, K. G., 84
 Bliss, A., 1, 90
 Briggs, J., 6
 Broadhead, Dr E., 90
 Byerley, B. L. J., 58, 68, 81
 Capener, A. L., 15, 74
 Cavanagh, G. G., 6
 Collinson, W. E., 82
 Cooper, B. A., 14, 71
 Cowley, J., 88
 Crotch, W. J. B., 2, 8, 39, 44, 50, 60, 63, 70, 74
 Currie, P. W. E., 62
 Dalby, Rev. A., 27
 Dale, J. A., 42, 54
 Dannreuther, Capt. T., 6, 16, 18, 68, 96
 Dexter, S., 58
 Dolton, H. L., 21
 Down, C., 69
 Durrant, K. C., 21
 Durrant, W. J., 24
 Earl, B. C. A., 8
 Edwards, Rev. W. O. W., 45
 Ellison, W. M., 58¹
 Forbes, Mrs W. M. Le F., 59
 Ford, R. L. E., 45
 Gardiner, B. O. C., 3, 8, 18, 45, 46, 56, 67
 Gay, P., 92
 George, R. S., 76
 Gibson, E. M., 49
 Goodbody, G., 7
 Graham, E. W., 82
 Hammond, H. E., 16, 34, 90
 Hanson, S. M., 11, 17, 23, 30, 47, 48, 81
 Hards, C. H., 75, 85
 Harper, G. W., 94, 95
 Harper, M. W., 96
 Hatcher, F. L., 83
 Henstock, Dr H., 10, 17, 38
 Holloway, P. H., 9, 34, 44, 46, 75
 Holmes, A. M., 77, 86
 Holroyd, G. C., 8, 14, 32, 52
 Hopkins, Miss B., 2, 15, 68, 70, 75
 Howarth, T. G., 92
 Jefferson, T. W., 26, 31
 Jesper, D. M., 11
 Kenington, F. E., 92
 Knight, J. E., 8, 51, 85
 La Touche, A. A. D., 36
 Lewis, E., 10, 44
 Ludlam, R., 66
 Lyon, F. H., 83
 Major, A. P., 14, 58, 69, 84
 Mead, W. J., 73

Merrill, H. M., 53
 Michael, P., 52, 64, 67, 77, 94
 Moore, J., 1, 30
 Neal, E. G., 6
 Nicholson, C., 36
 North, R. S., 67
 Ogden, J. B., 76, 84
 Parmenter, L., 57, 88
 Parsons, T., 37, 48, 49, 55, 62, 81
 Payne, J. H., 4, 33, 50
 Pearce, Rev. E. J., 22
 Platts, J. H., 1, 5
 Poole, K. H., 79, 86
 Port, M. H., 12
 Ramsden, E., 40
 Ranger, J. A., 20
 Renfrew, C., 3
 Russell, S. G. Castle, 56, 75
 Shaw, H. K. Airy, 49, 53, 69, 84
 Shield, D. H., 41
 Smith, K. G. V., 30
 Smith, P. Siviter, 18
 Speight, A. J. P., 53
 Spencer, K. A., 36, 37
 Spittles, C. E., 93
 Stockley, Lt.-Col. C. H., 38
 Syms, E. E., 87
 Taylor, P. G., 19, 31, 53, 62, 69
 Tozer, D., 9
 Tremewan, W. G., 38
 Trought, T., 18, 33, 64, 72, 87
 Trought, T. E. T., 5
 Waddington, L. G. F., 40, 70, 73
 Wallace, H. R., 93
 Watson, R. W., 93
 Weightman, E., 93
 Wheeler, R. J., 8
 Whicher, L. S., 23, 32, 61

SUBJECTS

Abstracts:—

The Invertebrate Fauna of Grass-Tussocks, 4, 21
 Colour Discrimination in the Drone Fly, 64
 A New Type of Killing Bottle, 71
 The Macrolepidoptera of the Moorgate, London, Bombed Sites, 79
 Advisers and Advisory Panel, 10, 23, 30
 Angleshades, Enterprising Larvae of, 93
 Annual General Meeting and Exhibition, 5, 47
 Badger, The, 86
 Beehive Intruders, 9
 Beekeeping in Essex, 71
 Best Day in the Field, My, 65
 Breeding Notes:—
 Assembling in Cities, 2
 Assembling of Oak Eggars, 45
 Browntail, 5
 Butterbur, 82
 Cannibal Larvae, 32
 Caterpillars deprived of Normal Food-plants, 36

- Comma Butterfly, 3
 Death's Head Hawk, 94
 Dotted Carpet, 83
 Duke of Burgandy Fritillary, 50
 Fox Moth, 8
 Lappet, 8
 Marsh Fritillary, 33, 50
 Orange Tip, 21
 Pairing Moths, 66
 Pale Clouded Yellow, 6
 Small Eggar, 40
 Swallowtail, 25, 31, 50
 Tethering, 5
 Vestal Moth, 83
- Coleoptera :—
- Abnormality in a Stag Beetle, 52
 A Parasitic Beetle, 20, 58, 82
 An Unusual Collection Pest, 3
 Collecting in South Africa, 22
 In a Coal Mine, 48
- Collecting Notes :—
- Caterpillars of the Dotted Carpet,
 Coleoptera collecting in South Africa,
 22, 31
 Collecting Clearwings, 16
 Collecting Lepidoptera in March, 13
 Collecting Lepidoptera in May, 29
 Collecting Lepidoptera in July, 54
 Collecting Lepidoptera in June, 41
 Collecting Lepidoptera in South Africa,
 76, 86
 Collecting Psocoptera, 90
 Collecting in South Africa, 73
 Early Records, 44
 English Butterflies in Far Countries, 38
 Field Meetings, 1949, 26, 34
 Ideal Spot, An, 58, 74
 Late Appearance, 31
 Melanic Moths, 6, 31
 Seasonal variation, 4
 South African Butterflies, 49
 Those were the days, 77
 Wingless Wonder, 45, 68
- Collections, The late Mr J. Walker's, 30
 Comma Butterfly, Unusual Conduct of, 9
 Council for the Promotion of Field Studies,
 20, 96
 Cryptic Devices a Protection against the
 Insect foes of caterpillars? Are, 7
 Correspondence, 76, 90
 Diptera, A word for parasitic, 30
 Directory of Natural History Societies, 42
 Dragonflies, 51, 63
 Earwig, 85
 Editor's Comments, 1, 23, 35, 57, 73, 81, 89
 The First Century, 19
 European Co-operation, 54
 Emeralds, Fading of, 95
 Essay Competitions, 42, 89
 Flies, 57
 Golden Plusia, The, 35
 Hints (see "Technique")
 Homeosis, 81
 Hybrid Blues, 37, 75
 Illustrations for the Bulletin, 85
 Insect Orders, 66
 Insects in S.-E. Devon in 1949, 89
 Lepidopterous Air-paths—A Theory, 92
 Marking Migrants, 95
 Mating Flight and Wintering of Clouded
 Yellow, 68
- Membership, 10
 Mines, Insects in, 48, 67, 81
 Mite in nest of Common Carder Bee, 92
 Mites on Butterflies, 14, 36, 58
 Mites on Butterflies and Beetles, 69
 Moths in Mines, 67
 Mounting Insects (see "Technique")
 Notes and Observations, 1, 8, 15, 34, 58, 67,
 75
 Camberwell Beauty, 18
 Silk Moth Notes, 74
 Second Year Privet Hawks, 77
 Silver Y, 2, 15
 Thirsty Graylings, 2
- Obituaries :—
- J. Walker, 21
 Leonard Woods Newman, 44
 Dr A. D. Imms, 45
 Captain C. H. Michaelson, 53
 G. Nicholson, 60
 H. Spencer, 87
- Orthoptera, 20
- Parasitic Flies, 30, 58
 Parasitic Wasp, 68, 84
 Parasitic Mite, 92
 Progress Report, 47, 81
 Publications received, 79
 Queries, 39, 53, 59, 84, 95
- Reviews :—
- Behaviour of Bees—and Beekeepers.
 H. J. Wadley, 11
 British Butterflies. Vere Temple, 55
 Butterflies and Moths found in the
 Counties of Cheshire, Flintshire,
 Denbighshire, Caernarvonshire, An-
 glesey and Merionethshire. S. Gor-
 don Smith, 17
 Butterfly Haunts. L. H. Newman, 11
 Butterfly Lives. S. Beaufoy, 64
 Butterfly Miracles and Mysteries. B.
 Acworth, 18
 Caterpillars of British Moths. W.
 J. Stokoe and G. H. T. Stovin, 33
 Guide de l'Entomologiste. G. Colas, 11
 Guide to the Smaller British Lepi-
 doptera. L. T. Ford, 56
 Handbooks for the Identification of
 British Insects. Royal Entomologi-
 cal Society of London, 87
 Vol. I, Pt. 5. Dermaptera and Orthop-
 tera. W. D. Hincks, 87
 Vol. I, Pt. 10. Odonata. Lt.-Col. F. C.
 Fraser, 87
 Vol. IX, Pt. 1. Diptera. H. Oldroyd, 88
 Hymenoptera aculeata of Bedford-
 shire. V. H. Chambers, 46
 Journal of the Society for British En-
 tomology, 46
 List of the Lepidoptera of Dorset.
 Pt. II. W. Parkinson Curtis, 87
 Moths and Memories. P. B. M. Allan, 46
 Naturalistes Belges, 64
 New Naturalist. A Journal of British
 Natural History, 17
 School Nature Study Journal, 56
 Skokholm Bird Observatory Report for
 1948, 55
 Water Life and Aquaria World, 27
 "Water Life" Series, 72

Silk Moth Notes, 74
 Sphingid Choir, 7
 Sponge Rubber, A use for, 14
 Spread of species with wingless females,
 The, 68
 Sugaring on the Sandhills, 96
 Switzerland, Visit to, 23
 Tough Customer, A, 84
 Tutt, J. W., 1
 Technique

Apparatus :—

Balsa Wood for setting boards, 3
 Collecting Tins, 19
 Field Tins, 53
 Glass slips for setting, 59
 Killing Bottles, 71
 Larva Tins, 19
 Larva Cage, Another type of, 39
 Mountcutter, A home-made, 24
 Net-fitting, 92
 Pairing Moths in Captivity, 66
 Prefabs for Cocoon-Spinners, 49
 Paper Setting Boards, 15
 Reflector for Searching Lamp, A
 cheap, 49
 Relaxing Tins, 19
 Sleeving bags, 14
 Sponge rubber, Use for, 14
 Waxed Cartons, Use for, 62
 Degreasing, 73, 93, 94
 Hints for Junior Members, 8, 14, 19, 32,
 53
 Killing Agents, 9, 16, 19, 61, 85
 Laurel leaves, 62
 Potassium cyanide, 62
 Tetrachlorethane, 19, 53, 62
 Notes on Mounting Insects, 60
 Pooter, Home-made, 89
 Preserving Set Insects, 40
 "Springing"—Can it be prevented, 95
 Tethering, 5
 Warning, A, 6

INDEX OF NAMES

ARACHNIDA

Arachnida, 55
 Thrombidiidae, 36
 Gamasids, 36
 Lycosid Spiders, 55

INSECTA

COLEMBOLA, 4
 ORTHOPTERA, 20, 46, 67, 79, 87
 Periplaneta americana, 48, 81
 Megaloptera, 23
 PLECOPTERA, 72
 ISOPTERA, 66

Calotermes flavicollis, 67
 Calotermitidae, 67
 Leucotermes lucifugus, 67
 Mastotermitidae, 67
 Termitidae, 67

CORRODENTIA } 90
 PSOCOPTERA }

Bertkania lucifuga, 91
 Elipsocus hyalinus, 91
 Elipsocus westwoodi, 91
 Liposcelis, 91

EPHEMEROPTERA, 72

ODONATA, 46, 72, 79, 87

Aeschna, 88
 Aeschna cyanea, 51, 63
 Aeschna isocetes, 88
 Aeschna mixta, 46
 Coenagriidae, 88
 Cordulia, 88
 Corduliidae, 88
 Enallagma, 88
 Erythromma, 88
 Ischnura, 88
 Ischnura elegans var. rubellum, 88
 Ischnura elegans var. rufescens, 88
 Ischnura pumilio, 46
 Libellula, 88
 Libellula depressa, 63
 Libellula quadrimaculata, 63
 Libellulidae, 88
 Pyrrhosoma, 88
 Somatochlora, 88
 Sympetrum flaveolum, 46
 Sympetrum fonscolombii, 46
 Zygoptera, 88

HEMIPTERA, 4, 15

Heteroptera
 Cryptocerata, 72
 Homoptera, 15, 58
 Membracidae, 73

NEUROPTERA, 23, 72

Megaloptera, 23

TRICHOPTERA, 38

LEPIDOPTERA

(Note :—Names used are those in the
 AES Check List, with certain older
 names also included when used in
 text.)

Acherontia atropos, 68, 74
 Acraeidae, 49
 Acraea calderena, 76
 Actias selene, 74
 Aegeria sphecoformis, 16
 Aglais urticae, 1, 14, 36, 38, 42, 84
 Agrotis puta, 96
 Agrotis saucia, 96
 Agrotis segetum, 96
 Agrotis vestigialis, 96
 Agrotis ypsilon, 96
 Alabama argillacea, 16
 Alcis jubata, 82
 Alcis repandata, 6
 Amathes agathina, 13
 Amathes baja, 13
 Amathes c-nigrum, 96
 Amathes ditrapezium, 13
 Amathes triangulum, 13
 Amathes xanthographa, 14, 96
 Amphipyra pyramidea, 30
 Amphipyra tragopogonis, 96
 Anarta myrtili, 74
 Antheraea mylitta, 74
 Anthocharis cardamines, 21, 41, 65
 Apamea monoglypha, 6
 Apatele rumicis, 29
 Apatura iris, 9, 54, 67, 75
 Aphantopus hyperantus, 13, 55
 Apteronia, 59

- Arctia caja*, 9, 40
Argynnis aglaia, 38, 82
Argynnis charlotta, 38
Argynnis cydippe, 38, 81
Argynnis euphrosyne, 29, 65
Argynnis lathonia, 38
Argynnis paphia, 55, 75
Argyroplote, 56
Aricia agestis, 37, 41, 59, 65
Aricia agestis artaxerxes, 37
Aricia agestis (agestis x artaxerxes), 37
Axyllis putris, 24
Basiothea medea, 8
Basiothea charis, 8
Bena fagana = prasinana, 29
Biston betularia, 6, 31
Biston betularia var. carbonaria, 4, 31
Biston strataria, 45
Bombycidae, 76
Brachyonychia sphinx, 45
Brephos parthenias, 65
Bupalus piniaria, 29, 59
Callimorpha hera, 45, 46
Callimorpha jacobaeae, 44
Callophrys rubi, 38, 41, 65, 67
Caradrina ambigua, 96
Caradrina clavipalpis, 67
Caradrina quadripunctata, 67
Catocala nupta, 17
Celastrina argiolus, 79
Celerio euphorbiae, 37
Celerio livornica, 67, 68, 74, 90
Cerastis vaccinii, 78
Cerura vinula, 4, 29, 66
Chaonia ruficornis, 78
Charaxes pelias, 86
Chiasmia clathrata, 29, 59
Clostera curtula, 29
Coenonympha pamphilus, 13
Coenonympha tullia, 59, 75
Colias alfacariensis, 6
Colias croceus, 1, 2, 6, 38, 49, 58, 68, 82, 86, 89
Colias croceus var. helice, 1, 90
Colias electra, 49, 86
Colias hyale, 6
Colocasia coryli, 79
Colotois pennaria, 30, 45, 79
Conistra vaccinii, 78
Cosmia trapezina, 32
Cossus cossus, 7, 46
Crocallis elinguaris, 79
Cucullia verbasci, 29
Cupido minimus, 41
Cybosia mesomella, 59
Cynia mendica, 29
Danaidae, 49
Danaus, 49
Danaus plexippus (chrysippus), 38, 86
Dasyampa rubiginea, 78
Dasychira pudibunda, 29
Deilephila elpenor, 4, 66, 79
Deilephila porcellus, 29
Demas coryli, 79
Diacrisia sannio, 59
Diarsia brunnea, 13
Diloba caeruleocephala, 30
Drepana binaria, 17
Drymonia dodonea = trimacula, 29
Ectropis bistortata, 4, 34
Ematurga atomaria, 29, 59
Erannis defoliaria, 45, 78
Erannis leucophaea, 45
Erannis marginaria, 34, 45, 78
Erebia aethiops, 36
Eriogaster lanestris, 40
Erynnis tages, 65
Euchloris smaragdaria, 85
Euphydryas aurinia, 8, 33, 50
Eupithecia spp., 29, 78
Euplagia quadripunctaria, 45, 46
Euproctis chrysorrhoea, 5
Eupsilia transversa, 33
Galleria mellonella, 9
Gastropacha quercifolia, 8
Geometra papilionaria, 85
Geometridae, 9, 76, 95
Gonepteryx rhamni, 42
Gonodontis bidentata, 29
Hadena albimaculata, 59
Hadena trifolii, 2, 96
Hamearis lucina, 50
Harpyia bicuspis, 29
Hemaris fuciformis, 29
Hemaris tityus, 29
Hemistola immaculata, 85
Hepialus lupulinus, 4
Herse convolvuli, 75
Hesperiidae, 86
Hipparchus papilionaria, 85
Hippotion celerio, 8
Hydroecia petasitis, 82
Hyloicus pinastri, 1
Jodia croceago, 78
Lampides boeticus, 38, 49, 86
Lampra fimbriata, 96
Laothoe populi, 2, 29, 66
Laphygma exigua, 84
Lasiocampa quercus, 5, 45, 50, 59
Leptidea sinapis, 29, 67, 75
Leucania albipuncta, 96
Leucania pallens, 96
Limenitis camilla, 55, 67, 75
Lithina chlorosata = petraria, 29
Lycaena dispar, 54
Lycaena phlaeas, 18, 90
Lycia hirtaria, 4
Lycophotia varia, 13
Lysandra bellargus, 18, 37, 41, 65, 75
Lysandra bellargus var. punctatus, 75
Lysandra cordon, 18, 37, 41, 69, 75
Lysandra (var. polonus), 37, 75
Macroglossum stellatarum, 29, 76
Macrothylacia rubi, 8, 59
Maculinea arion, 17
Malacosoma neustria, 36
Mamestra brassicae, 29
Maniola jurtina, 13, 14, 55, 75
Maniola tithonus, 13, 55
Melanargia galathea, 13, 36, 55, 58, 69
Melanarcha persicariae, 4, 31
Meristis trigrammica, 29
Mimas (Dilina) tiliae, 2, 4, 29, 79
Mormo maura, 13
Nephele eson, 8

- Noctuidae, 70, 76
 Nola cucullatella, 29
 Nonagria typhae, 73
 Notodonta ziczac, 29
 Nymphalidae, 86
 Nymphalinae, 59
 Nymphalis antiopa, 18
 Nymphalis io, 1, 36, 42, 90
 Nymphalis polychloros, 8, 38
 Ochloides venata ssp. septentrionalis, 13, 79
 Ochropleura plecta, 96
 Operophtera brumata, 45, 78
 Oporinia dilutata, 78
 Orgyia antiqua, 4, 31
 Orgyia gonostigma, 40
 Panemeria tenebrata, 29
 Papilio demoleus, 49, 86
 Papilio machaon, 25, 29, 31, 38, 50
 Papilio merope, 49
 Pararge aegeria, 13
 Pararge megera, 13
 Parasemia plantaginis, 59
 Phalera bucephala, 4, 44, 66
 Pheosia gnoma, 29
 Pheosia tremula, 29
 Phigalia pedaria, 6, 45
 Philosamia cynthia, 74
 Philudora potatoria, 4, 30, 50
 Phlogophora, meticulosa, 2, 93
 Phragmatobia fuliginosa, 9
 Pieridae, 1, 49, 68, 90
 Pieris brassicae, 31, 38, 85, 96
 Pieris napi, 38, 42
 Pieris rapae, 31, 38
 Plebejus argus, 17, 55
 Plusia gamma, 2, 9, 15, 83, 90
 Plusia moneta, 35
 Poecilocampa populi, 45
 Polia hepatica (tincta), 13
 Polia nebulosa, 13
 Polygonia c-album, 1, 3, 9, 38, 58, 68, 79
 Polygonia c-album var. hutchinsoni, 3
 Polyommatus icarus, 40, 75, 76
 Polyplocia ridens, 79
 Pontia daplidice, 38, 54
 Procus furuncula, 96
 Procus strigilis, 6, 31
 Pseudopanthera macularia, 29, 59
 Psyche helix, 53
 Psyche planorbis, 53
 Psychidae, 53, 59
 Pterostoma palpina, 17
 Pyrausta } aurata, 59
 Rhodaria }
 Rhodometra sacraria, 83, 96
 Saturnia pavonia, 2, 50, 54, 59
 Saturniidae, 50, 87
 Satyridae, 36, 86
 Satyrus semele, 2
 Selenia tetralunaria, 4, 29
 Sematuridae, 76
 Semiothisa liturata, 59
 Sesia apiformis, 29
 Sesiidae, 29
 Smerinthus ocellata, 2, 66, 79
 Sphingidae, 7, 54, 76, 79
 Sphinx ligustri, 66, 75, 77
 Spilosoma lutea, 79
 Sterrha muricata, 59
 Strymonidia pruni, 67
 Strymonidia w-album, 41, 67
 Taeniocampa spp., 78
 Tegeticula, 64
 Tephrosia bistortata, 1
 Tephrosia crepuscularia, 1
 Terias butleri, 76
 Thecla betulae, 41, 55, 67
 Thecla quercus, 41, 67, 79
 Thymelicus lineola, 67
 Thymelicus sylvestris, 17
 Tineae, 67
 Triphaena fimbriata, 13, 96
 Triphaena janthina, 13
 Triphaena pronuba, 96
 Utetheisa ornatrix, 55
 Vanessa atalanta, 1, 31, 38, 68, 90
 Vanessa cardui, 1, 38, 42, 49, 54, 68, 80, 95
 Vanessaidae, 1
 Xylocampa lithoriza (areola), 78
 Zygaena filipendulae, 65
 Zygaena trifolii, 65
 Zygaenidae, 4, 61, 65
- COLEOPTERA, 4, 9, 10, 15, 46, 48, 62, 74
 Acanthocinus aedilis, 48, 81
 Amphimallon, 69
 Anthea, 23
 Aphodius, 32, 69
 Brachinus, 23
 Brenthidae, 32
 Buprestidae, 23
 Carabidae, 4, 23
 Cassidinae, 31
 Cathersius, 32
 Cerambycidae, 32, 48
 Cetorinae, 32
 Cicindelidae, 10, 23
 Chrysomelidae, 31
 Copris, 32
 Coptorhina, 32
 Curculionidae, 32
 Dorcus, 32
 Dryops femorata, 78
 Dytiscidae, 23, 72
 Dytiscus, 23, 63
 Dytiscus marginalis, 63
 Elateridae, 23
 Geotrupes, 32, 69
 Gyrinidae, 23
 Heliocopris, 32
 Hister, 32
 Histeridae, 32
 Hispinae, 31
 Hopliinae, 32
 Lagrinae, 31
 Lucanidae, 32, 69
 Lucanus cervus, 52
 Macrotoma, 32
 Melolontha, 69
 Melolonthinae, 32
 Metoecus paradoxus, 20, 58, 82
 Onitus, 32

- Onthophagus*, 32
Oönotus, 32
Oxythrea, 32
Paussidae, 23
Phyllopertha, 69
Psilonychus, 32
Rutelinae, 32
Sagrinae, 31
Saperda carcaria, 48
Scarabaeidae, 32
Sinodendron cylindricum, 69
Sisyphus, 32
Staphylinidae, 4, 23
Staphylinus, 23
Tribolium castaneum, 3
- HYMENOPTERA**, 4, 10, 23, 30, 38, 46, 48, 62, 66
Anthophorinae, 10
Apis mellifica, 11, 71
Apoidea, 10
Bombidae, 68
Bombus agrorum, 92
Bombus terrestris, 78
Coelioxinae, 10
Diptazoninae, 46
Ichneumonidae, 4, 22, 46
Mutilla europaea, 68, 84
Nomadinae, 10
Siricidae, 48
Urocerus gigas, 48
Vespula germanica, 21, 58
Vespula vulgaris, 20, 58
- DIPTERA**, 30, 38, 46, 57, 58, 79, 88
Acrocera globulus, 57
Asilus crabroniformis, 57
Bibiomarci, 57
Cecidomyiidae, 57
Chironomidae, 57
Cordiluridae, 58
Conopidae, 58
Conops vesicularis, 58
Culicoides obsoletus, 57
Cyrtidae, 57
Dilophus, 58
Dolichopodidae, 57
Dorilaidae, 58
Dorilas campestris, 58
Empis femorata, 57
Empis tessellata, 57
Eristalis tenax, 64
Fannia, 58
Gonoglossum weidemanni, 58
Herina lugubris, 58
Hippoboscidae, 58
Larvaevoridae, 58
Larvaevora fera, 58
Lasioptera rubi, 57
Liancallus virens, 57
Mesembrina meridiana, 58
Muscidae, 58
Mycetophila fungorum, 57
Nematocera, 57
Nemotelus uliginosus, 57
Norellisoma spinimanum, 58
Ornithomya avicularis, 58
Otitidae, 58
Phora aterrima, 58
Phoridae, 58
Phycoptera albimana, 57
Pipunculidae, 58
Rhagio scolopacea, 57
Rhingia campestris, 58
Stratiomyidae, 57
Syrphid, 58
Tabanidae, 57
Tabanus distinguendus, 57
Tachinids, 7, 30, 57, 58
Thereva annulata, 57
Thyridanthrax fenestralis, 57
Tipula rufina, 57
Tipulidae, 57
Trichocera saltator, 57
Trypetidae, 58



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OCTOBER 1949

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Abbreviations

*=Junior Member
agric.=agricultural
aq.=aquatic
B.=biology
C.=Coleoptera (beetles)
D.=Diptera (flies)
E.=ecology
econ.=economic
ent.=entomology
esp.=especially
exot.=exotic
fw.=freshwater
gen.=general
H.=Hymenoptera (ants, bees, wasps, sawflies, parasites)
Hem.=Hemiptera (bugs)
Het.=Heteroptera (het-bugs)
Hom.=Homoptera (hom-bugs)
L.=Macrolepidoptera (moths and butterflies)
M.=migration
mic.=microscopy
ML.=Microlepidoptera
NH.=natural history
O.=Odonata (dragonflies)
ornith.=ornithology
P.=photography
R.=Rhopalocera (butterflies)
Z.=zoology

The highest membership number included in this list is No. 1631.

Ordinary Members

Abeny, P. A. (1583*), 29 Station Rd., Aylesford, Kent. (L., D.)
A'brook, J. (1582*), 12 Lakenheath, Southgate, London N.14. (gen. ent.)
Adams, D. H. (1095), 2 Park Rd., Haywards Heath, Sussex. (C., L., D.)
Adams, F. A. (267), 8 Wellingborough Rd., Broughton, Kettering, Northants. (gen. ent.)
Adams, H. W. (510), 12 Woodborough Rd., Nottingham. (L.)
Adams, Mrs J. M., B.Sc., F.Z.S. (508), 43 Merchland Rd., London S.E.9 (B.)

Adams, R. W. (1237), 32 Moor Park Rd., Northwood, Mddx. (L.)
Adams, R. W. G. (1491*), 53 Bower Hill, Epping, Essex. (L.)
Addison, Rev. W. R. F. (230), Coltishall Rectory, nr. Norwich, Norfolk. (L.)
Ainsworth, Miss J. M. (1617*), Poplar House, 14 Monmouth St., Topsham, Devon. (L.)
Alderton, R. F. (1170), Glen Cottage, Butlers Dene Rd., Woldingham, Surrey.
Allaway, J. (349), 22 Lightwood Hill, Warley, Smethwick, Staffs. (L.)
Allen, D., F.R.P.S., F.R.E.S., F.R.S.A. (711), 698 Warwick Rd., Solihull, Warwickshire. (H., L.)
Allen, Rev. P. V. M. (1130), The Vicarage, South Bank, Middlesbrough, Yorks. (L.)
Almy, V. C. P. (1387), Avoca, Third Ave., Colesdown Hill, Billacombe, Plymstock, Devon. (H., D. (Syrphidae), L., C., ornith., P.)
Anderson, W. G. (1446), 8 Holly St., Gosport, Hants. (gen. ent.)
Angus, W. G. (883), Principal, Watt Memorial School, Greenock, Renfrewshire. (C., D.)
Appleton, A. H. (1612), Spinney Hollow, Disley, nr. Stockport, Cheshire. (H., L.)
Ashe, G. H. (1532), Gribblemead, Colyton, Devon. (C.)
Ashforth, H., F.R.E.S. (1063), 24 Woodmans Way, Two Hedges Rd., Bishops Cleeve, Cheltenham, Glos. (H.)
Ashmore, J. S. D. (826), Ward's End Farm, Adlington, Macclesfield, Cheshire. (L., C.)
Ashwell, D. A. (223), 34 North St., Bishops Stortford, Herts. (L., O., P.)
Atkinson, R. S., F.R.A.S. (1336), 46 White Hill Ave., Barnsley, Yorks. (C., L., B., NH.)
Austin, C. (1571*), 156 Hamilton Ave., Tolworth, Surbiton, Surrey. (L.)
Austin, N. J. (966), Chapel House, High St., Thorpe-le-Soken, Essex. (L., C., H., Hem., O., ornith., geology, conchology)

- Bailey, N. M. (1230), Hill Crest, Ash Grove, Limefield, Bury, Lancs. (L., gen. ent., botany, ornith.).
- Bain, Miss P. C. (492), St Boswell's, Dene Rd., Northwood, Mddx. (L., rearing, NH.)
- Baker, C. R. B. (1533*), St Lawrence Vicarage, Affpuddle, Dorchester, Dorset. (L., H.)
- Baker, Capt. D. B. (1511), c/o 21 Quarry Park Rd., Cheam, Sutton, Surrey. (C., H.)
- Baker, R. T. (1522*), Barwell Cottage, Chessington, Surrey. (L., esp. silk moths)
- Balfour-Browne, Prof. F., F.R.S.E. (340), Brocklehurst, Collin, Dumfries. (gen. ent., aq. C.)
- Ballard, G. F. T. (1592*), 175 Boundary Rd., Woking, Surrey. (L.)
- Bambury, Capt. P. J. R., M.A. (1566), Ardingly College, Sussex. (gen. ent.)
- Banner, Dr J. V. (103), 41 Varndean Gdns., Brighton 6, Sussex. (L.)
- Barbrook, G. M. (1164), 23 Eric St., Oldham, Lancs. (gen. ent., esp. L., pond life)
- Barham, M. J. D. (459), 17 St Martin's Grove, Leeds 7, Yorks. (L.)
- Barker, M. J. W. (1606*), 65 Pinner View, Harrow, Mddx. (L.)
- Barnard, P. (761), 12 St Leonard's Ave., Windsor, Berks. (L., mic.)
- Barnett, T. L. (231), 31 Littleheath Rd., Selsdon, Surrey. (L.)
- Bartlett, O. W. (1559), 3 Clarendon Gdns., Trowbridge, Wilts. (L., H., D.)
- Barton, R. E. C. (1502*), Benfreys, West Clandon, nr. Guildford, Surrey. (L.)
- Bates, J. K. (814*), Welland Terrace, Barrowden, nr. Oakham, Rutland. (NH., esp. L.)
- Battersby, Dr A. W. M. (1337), Royston, Leegomery Rd., Wellington, Shropshire. (H., L.)
- Baxter, R. (1267), 16 Bective Rd., London E.7. (L.)
- Bayliss, Miss B. E. (961), 22 Tudor Way, London N.14. (gen. ent.)
- Baynes, E. S. A., F.R.E.S. (1221), 2 Ashendale Rd., Glenageary, Co. Dublin, Eire. (L., gen. ent.)
- Beattie, I. S. (142), 21 Stirling Rd., Edinburgh 5. (L.)
- Beafoxy, L. S., M.A. (628), 54 Bower Mount Rd., Maidstone, Kent. (Breeding L., NH.)
- Beafoxy, S., B.Sc., A.M.I.E.E., F.R.P.S. (627), 98 Tuddenham Rd., Ipswich, Suffolk. (L.)
- Becher, Lt.-Col. L. E. (1214), Newstead, Charterhouse Rd., Godalming, Surrey. (L., gen. ent.)
- Deebee, A. O. (1382*), 18 Jesson Rd., Walsall, Staffs. (L.)
- Bell, Dr Fairfax (872), c/o D.M.S., Dar-es-Salaam, Tanganyika. (R.)
- Bennett, Lt. (A) C. D., R.N. (1484), c/o 41 Commercial St., Senghenydd, nr. Caerphilly, Glam. (gen. ent.)
- Bennett, M. J. (830*), Leechwell Cottage, Totnes, Devon. (L.)
- Bennett, N. Chaplin (544), 37 Fore St., Totnes, Devon. (L., NH., ornith.)
- Benson, R. H. (1444), Denehurst, Jesmond Park East, Newcastle-on-Tyne 7. (L.)
- Bentley, E. W., Ph.D. (985), 41 Cumberland Rd., Bromley, Kent. (H.)
- Berry, J. E. (1072), School House, Grange-over-Sands, Lancs. (H., Aculeata, pollen)
- Bessant, R. M. (367), 831 Field End Rd., Ruislip, Mddx. (gen. ent. esp. C.)
- Bing, R. C. (1171*), Royal Clarence Hotel, Bridgwater, Som. (L., mic., chemistry)
- Binning, H. G. (1427), 13 Graig Park Lane, Newport, Mon. (L.)
- Bird, P. F. (896), c/o Mrs Read, 86 Coombe Lane, Coombe Dingle, Bristol 9. (L., O., H. parasitica)
- Blair, Dr K. G. (197), Pentwyn, Afton Rd., Freshwater, I.O.W. (C., O., gen. ent.)
- Blake, Mrs M. A. (1451), 20 Crown Lane Gdns., London S.W.16. (silk-moths)
- Blake, T. G. (1376*), 20 Crown Lane Gdns., London S.W.16. (L.)
- Bland, S. E. (1328), 20 North St., Exeter, Devon. (H.)
- Blasdale, P. (1381), 10 Quarry Hill Rd., Ilkeston, Derby. (L., C.)
- Blathwayt, C. S. H., M.A. (651), 27 South Rd., Weston-super-Mare, Somerset. (L.)
- Bliss, A. (287), Golden Mist, Whitford, Axminster, Devon. (L.)
- Block, M. R. F. (1116*), Alpha Cottage, Francis Rd., Ware, Herts. (gen. ent. esp. L.)
- Boardman, Dr D. Livesey (1132), 40 Scholes Lane, Prestwich, Manchester, Lancs. (L., C.)
- Bohe, K. H. (912), 19 Hengist Rd., London, S.E.12. (L.)
- Boon, C. O. (1266), 49 South Court Ave., Dorchester, Dorset. (gen. ent.)
- Bowen, Miss J. C. (1438), 94 Bushey Hill Cres., Watford, Herts. (gen. ent.)

- Bowring, P. T. (1029), The Tower House, Belle Vue Rd., Exmouth, Devon. (gen. ent.)
- Boyes, J. D. C., B.Sc., A.R.I.C., A.R.P.S. (850), Wimborne, Millfields, Nantwich, Cheshire. (L., esp. vars. and hybrids)
- Bradley, A. (219), Four Elms, Granary Lane, Budleigh Salterton, Devon. (L.)
- Bradley, J. D. (195), 157 South Park Rd., London S.W.19. (L.)
- Bradley, P. L. (1360), 1 Holland Walk, Stanmore, Mddx. (L., H.)
- Braham, A. C., F.Z.S., F.R.E.S. (809), 66 Sheepridge Rd., Huddersfield, Yorks. (gen. ent., C., arachnology, NH., B.)
- Brangham, A. Norman (18), 9 St Albans Grove, London W.8. (Ants)
- Briegel, R. H. (539), 141 Burnt Oak Lane, Sidcup, Kent. (L.)
- Briers, Herbert C. (128), 12 St Albans Rd., Highgate Rd., London N.W.5. (L.)
- Briggs, J. (832), 15 Frimley Drive, Little Horton, Bradford, Yorks. (L., C.)
- Briggs, Miss P. (881*), 44 Park Lane, Whitefield, nr. Manchester. (L., gen. ent.)
- Britton, E. B. (232), Dept. of Entomology, British Museum (Nat. Hist.), Cromwell Rd., London S.W.7. (C.)
- Britton, Miss E. L., B.Sc. (928), 36 Chorley Drive, Sheffield 10. (gen. and econ. ent., NH., E., ornith.)
- Britton, Mrs L. M. (108), 10 Sandringham Rd., Parkstone, Dorset. (L.)
- Brixey, Miss A. (1364*), Dartmouth House, Latchmoor Ave., Gerrards Cross, Bucks. (L.)
- Broome, R. R., F.L.S., F.R.E.S. (653), 47 Keswick Rd., Boscombe, Bournemouth, Hants. (Salmon and trout fisheries, botany, aq. ent.)
- Brown, R. M. (1573), Forester Training School, Lynford Hall, Mundford, nr. Thetford, Norfolk. (gen. ent. esp. H.)
- Brunsdon, J. R. (759), Westminster Bank House, Westerham, Kent. (L. esp. breeding)
- Buckler, H. A. (334), Sutton Bassett, Market Harborough, Leics. (L., ML.)
- Buckley, A. (1215), 412 Leeds Rd., Dewsbury, Yorks. (L.)
- Bull, Dr G. V. (160), White Gables, Sandhurst, Kent. (L.)
- Burnard, C. V. W., F.R.E.S., A.M.I.N.A. (1271), Yew Tree Cottage, Ashton Lane, Bishops Waltham, Hants. (L.)
- Burrows, D. N. (1517), 76 Woodside Court Rd., Addiscombe, Croydon, Surrey. (L.)
- Burton, I. S. (798*), 36 Regent Rd., Surbiton, Surrey. (gen. ent. esp. L.)
- Burton, P. J. (1199), 1 Marine Parade, Lowestoft, Suffolk. (L.)
- Burton, W. V. (1079), 18 Terminus Rd., Sheffield 7. (L.)
- Bushby, L. C. (1075), Curator of Insects, Zoological Society of London, London N.W.8. (gen. ent.)
- Byerley, B. L. J., F.R.E.S. (788), 48 Elmgrove Rd., Harrow, Mddx. (gen. ent.)
- Byers, F. W. (137), 59 Gurney Court Rd., St Albans, Herts. (L.)
- Byford, W. J. (982), 72 Oakdale Rd., London E.11. (L., gen. ent.)
- Cameron, Dr T. W. F. (1007), Highfields, Walderslade, Chatham, Kent. (gen. ent.)
- Capener, A. L. (6), St George's Home for Boys, P.O. Cleveland, Johannesburg, S. Africa. (Hom. except Aphididae and Coccidae, Myrmeleonidae, gen. ent.)
- Carr, R. W. D. (1175), Hillcrest, Totteridge Lane, London N.20. (L.)
- Cartwright, G. J. (958*), 39 Queen Anne's Grove, London W.5. (L.)
- Cater, H. R. St Clair (587), Hergest Mill, Kington, Herefordshire. (O., silkmoths)
- Cavanagh, G. G. (1004), 40 Priory Hill, Dartford, Kent. (gen. ent.)
- Cave, R. G. (1338*), 16 Round St., Rugby, Warwickshire. (L.)
- Chambers, A. E. C. (450), 36 Watergate, Grantham, Lincs. (L.)
- Champion, A. F. (777), 1 Cornwall Close, Barking, Essex. (L.)
- Chapman, D. G. (1590*), Ngoma, Helmore Cres., Laindon, Essex. (L.)
- Charlson, S. (520), 89 Market St., Stalybridge, Cheshire. (ML., M.)
- Chipperfield, H. E. (64), 27 Chitton Ave., Stowmarket, Suffolk. (L.)
- Christie, L. (710), Station House, London Rd., Hackbridge, Wallington, Surrey. (L.)
- Chynoweth, J. D. (905), 2 Cumberland Rd., North Harrow, Mddx. (L.)
- Claridge, M. F. (1420*), 117-121 Railway Terrace, Rugby, Warwickshire. (L.)

- Clark, A. B. (1495), 87 Vicarage Rd., Watford, Herts. (L., gen. ent.)
- Clark, D. J. (1369), 39 Welch Rd., Southsea, Hants. (O., H.)
- Clarke, C. A. (1569), High Close, Thorsway, Caldby, Cheshire. (L.)
- Clarke, G. J. (579*), 3 Harcourt Rd., Wallington, Surrey. (L.)
- Clarke, L. B. (157), Turkey Hall, Eldersfield, Glos. (L., beekeeping, agric. ent.)
- Clarkson, F. W. (1437*), Sheriff Hall, Sheriff Highway, Hedon, nr. Hull, Yorks. (L.)
- Classey, E. W., F.R.E.S. (41), 5 Carlton Ave., Feltham, Mddx. (L., mosquitoes)
- Cochrane, R. C. (1253), 29 Rafford Way, Bromley, Kent. (L.)
- Coggon, J. G. (582), 19 Chatsworth St., Chester Rd., Sunderland, Co. Durham. (L.)
- Collier, Major A. E. (1066), c/o Lloyds Bank, 6 Pall Mall, London S.W.1.
- Collins, G. B. (1036), 19 Torridge Rd., Thornton Heath, Surrey. (gen. ent.)
- Collins, R. J., F.R.E.S. (256), Dept. of Entomology, Natural History Museum, Cromwell Rd., London S.W.7. (L. esp. World Geometridae)
- Collinson, W. E. (247), 20 Pye Nest Drive, Halifax, Yorks. (L. esp. Bombyces)
- Collver, N. A. B. (132), 27 Guildford Way, Wallington, Surrey. (L.)
- Colyer, C. N., F.I.A.C., F.R.E.S. (404), 26 Ewart Grove, London N.22. (D.)
- Concannon, B. P. P. (1473*), 50 Carbery Ave., West Southbourne, Bournemouth, Hants. (L.)
- Conder, P. J. (1568), Dale Fort Field Centre, Haverfordwest, Pems. (Ent. of Skokholm Island)
- Cooper, Beowulf A., B.Sc., A.R.C.S., F.R.E.S. (19), 27 Spilshy Rd., Boston, Lincs. (gen. ent., L., M., E., econ. ent., C. esp. Elateridae)
- Cooper, Mrs G. M. R., B.Sc. (447), 27 Spilshy Rd., Boston, Lincs. (B.)
- Cooper, Mrs L. d'O. (1408), 61 Okehampton Rd., London N.W.10. (gen. ent.)
- Cooper, T. A. (617), 66 Elmstead Gdns., Worcester Park, Surrey. (C., L.)
- Cork, H. (1690), 73 Queenswood Rd., Forest Hill, London, S.E.23. (gen. ent.)
- Cornelius, J. A. (1020), 29 Grangecliffe Gdns., London S.E.25. (L.)
- Cousins, P. J. (901), Westward, Arthur Rd., Wokingham, Berks. (L., H., agric. ent.)
- Cove, Miss I. M., B.Sc. (612), c/o Avery Hill College, London S.E.9. (B., gen. ent.)
- Cowley, J., M.A., F.R.E.S. (771), Holywell House, Edington, Bridgewater, Som. (O. of world, D., H.)
- Cox, A. D. L. (749), Edale, Ipswich Rd., Colchester, Essex. (C.)
- Cox, C. J. (1357*), 78 Wellington Rd., Bush Hill Park, Enfield, Mddx. (L.)
- Coxey, S. (358), 17 Mornington Rd., Bolton, Lancs. (L.)
- Craig, Miss J. C. D., B.Sc., A.R.I.C. (930), 2 Devonshire Gdns., Glasgow W.2. (L.)
- Cripps, C. H., B.A. (730), Bull's Head Farm, Eakley Lanes, Stoke Goldington, Bletchley, Bucks. (L. esp. R.)
- Crisp, E. (668), High Street, Heathfield, Sussex. (gen. ent.)
- Crocker, D. H. (1552*), 38 Farlington Avenue, Drayton, Portsmouth, Hants. (L.)
- Cross, G. S. E. (1453), 31 Avenue Rd., London N.12. (L.)
- Crotch, W. J. B., M.A., A.K.C. (1181), 5b Stanley Cres., London W.11. (L. esp. Saturnidae, Bombycidae and Sphingidae)
- Crow, P. N. (393), Heathcote, Cookham Dean, Berks. (L.)
- Crutwell, G. H. W. (118), Old Ford House, Frome, Som. (L.)
- Cumber, Miss G. R. (1015*), 23 Wood Lane, Isleworth, Mddx. (L.)
- Cunningham, D. (1233), 42 Rae St., Dumfries. (L., botany)
- Curd, O., F.Z.S. (129), Elsinore, Whiston Lane, Prescott, Lancs. (L.)
- Currie, P. W. E. (977), 102 Burdon Lane, Belmont, Sutton, Surrey. (O., H.)
- Curtis, A. E. (877), The Cottage, Ifold Estate, Loxwood, nr. Billingshurst, Sussex. (L., including exot., breeding)
- Dalby, Rev. A. (1527), Amberley, Kidlington, Oxon. (L.)
- Dale, Alan, B.Sc. (908), The Knoll, Comberford Lane, Wigginton, Tamworth, Staffs. (Beekeeping, NH., gen. ent.)
- Dale, J. A. (1206), The Old Vicarage, Hatfield, Herts. (gen. ent.)
- Dale, W. E. (42), 54 Baldwyns Park, Bexley, Kent. (L.)

- Dalton, R. F., M.A. (1530), The Dorset County Museum, Dorchester, Dorset. (Museum display)
- Daltry, H. W., F.R.E.S., M.S.B.E. (972), Bar Hill, Madeley, Crewe, Cheshire. (Hem., neuroptera, trichoptera, ML., C., H.)
- Dannreuther, Capt. T., R.N. (60), Windycroft, Hastings, Sussex. (M.)
- Davidson, A. R. (575), 2 Foster Rd., Formby, Liverpool. (gen. ent., L.)
- Davies, G. M. (1394*), Glencarn, Gorsley, Ross-on-Wye, Herefordshire. (C., D.)
- Davies, M. J. (760), 31 Kinross Ave., Worcester Park, Surrey. (C. esp. Geodephaga)
- Dawes, A. J. (886), 17 Copse Hill, London S.W.20. (L.)
- Dawson, D., F.L.S., M.I.P.A., F.R.H.S. (664), 22 Woodlands Rd., Harrow, Mddx. (horticultural ent.)
- Day, G. V. (29), Furlong Rd., Stoke Ferry, King's Lynn, Norfolk. (L.)
- Deacon, G. E. (1290), Brundall, Norwich, Norfolk (gen. ent.)
- Dean, Miss J. M. (1378*), Sherwood, Greendene, East Horsley, Surrey. (L.)
- de Andrade, N. F. (1439), S. Joas do Estoril, Casal Novo, Portugal. (H.)
- Deimel, I. R. (410), c/o I. Ingram, Esq., 23 Corby Rd., Mapperley, Nottingham. (L.)
- de Mercado, G. I. (1588), Meteorological Dept., Post and Telegrams, Khartoum, Sudan, Africa. (D., Thysanura)
- Dening, J. C. (1424), Dinorben Beeches, Fleet, Hants. (L.)
- de Worms, Baron C., Ph.D., F.R.E.S. (260), 26 Common Close, Horsell, Surrey. (L.)
- Dexter, S. (847), Rosevean, Constantine Bay, nr. Padstow, Cornwall. (gen. ent.)
- Dibb, J. R., F.R.E.S. (1195), 30 Plantation Rd., Wollaton, Nottingham. (C., H., ephemeroptera)
- Digby, L. M. (1516*), Derwent Hotel, Belgrave Rd., Torquay, Devon. (gen. ent.)
- Dobson, R. M. (1111), c/o Ministry of Agriculture, Infestation Division, 69 Berkeley St., Glasgow C.3. (gen. ent. esp. C.)
- Dolton, H. L. (1122), 36 Chester St., Reading. (L.)
- Dorrington, B. G. (1593*), 19 Bryn Drive, South Reddish, Stockport, Cheshire. (Aq. ent., H.)
- Down, C. (59), 7 Mersham Drive, London N.W.9. (L.)
- Driver, H., B.Sc. (557), 16 The Crescent, London Rd., Northwich, Cheshire. (L., ML., H., bee-keeping)
- Duke, A. J. H. (97), 86 Strubens Rd., Mowbray, Cape Town, S. Africa. (L.)
- Duncan, S. (280), Lone Pine, Anlaby, Yorks. (L.)
- Dunkin, D. K. (1487*), 69 Caernarvon St., Netherfield, Notts. (L.)
- Durham, J. (1174), 62 Reigate Rd., Brighton 5, Sussex. (NH.)
- Durrant, K. C. (1375), The Hollies, Theatre St., E. Dereham, Norfolk. (gen. ent. esp. D.)
- Durrant, W. J. (1196), 11 Hazel Bank, Tolworth, Surrey. (D., O., C.)
- Dutton, Miss P. R. (1306*), Ashcroft, Malvern Rd., Staunton, nr. Gloucester. (gen. ent. esp. C.)
- Dutton, P. W. (1268*), Ashcroft, Malvern Rd., Staunton, nr. Gloucester. (gen. ent.)
- Dyce, J. W. (1602), 45 Norbury Cres., Norbury, London S.W.16. (L.)
- Dyson, R. C., N.D.H., F.R.E.S. (91), 112 Hollingbury Park Ave., Brighton 6, Sussex. (L., food-plants)
- Eade, A. (1185), 199 Lynmouth Ave., Stonecot Hill, Morden, Surrey. (L.)
- Eade, G. J. (190), 3 Rutland Rd., Hove 3, Sussex. (L.)
- Eagles, T. R. (194), 32 Abbey Rd., Enfield, Mddx. (L.)
- Earl, B. C. A. (1388*), 2 South Park, Loose Rd., Maidstone, Kent. (L.)
- Eberlie, W. J. D. (70), Brooke House, Crawley Green Rd., Luton, Beds. (L., O.)
- Ecutt, A. W. (1536), Lindum, Highcross Lane, Rogerstone, Newport, Mon. (gen. ent.)
- Edelsten, H. M., F.R.E.S. (208), Bramble Hill, Balcombe, Sussex. (L.)
- Eden, M. (1626*), 6 Orchard St., Ashton-in-Makerfield, nr. Wigan, Lancs. (Silk moths)
- Edwards, J., B.Sc. (844), 81 Hassam Parade, Newcastle, Staffs. (O., D.)
- Edwards, R. C. (949), Arlessey, Pilgrim's Way, Westerham, Kent. (gen. ent.)

- Edwards, Canon T. G., M.A., F.Z.S. (754), Holy Trinity Vicarage, London S.W.2. (gen. ent. esp. L.)
- Edwards, Rev. W. O. W., M.A. (570), Nynehead Court, Wellington, Som. (L.)
- Egglishaw, H. J. (1457*), 96 Durham Rd., Spennymoor, Co. Durham. (gen. ent.)
- Eley, R. (1201), c/o Mr Ruddock, Hall Cottages, Nowton, nr. Bury St Edmunds, Suffolk. (L., heterocera)
- Elliott, D. M. (1433*), 1 Upper Winfield Ave., Brighton 6, Sussex. (L.)
- Ellis, J. E. (1255), 31 Manor Wood Rd., Purley, Surrey. (L., D.)
- Ellison, W. M. (1318), 40b Victoria Rd., Scarborough, Yorks. (L.)
- Emmet, A. M., M.B.E., M.A. (1379), St Edwards School, Oxford. (L.)
- Enfield, Mrs J. (1503), 44 Selkirk Road, Ipswich, Suffolk. (Arachnida, H.)
- England, W. E. (183), 7 Tea Garden Terrace, Sheffield 4. (L.)
- Ensor, P. C. (891), 26 Webb Lane, Hall Green, Birmingham 28. (L.)
- Entrican, Miss M. C. (764), Channing School, Highgate, London N.6. (L.)
- Esslemont, I. (775*), 16 Westfield Terrace, Aberdeen. (Mosquitoes, aq. C., O.)
- Evans, J. J. T. (1576*), Mill Field, Mill Lane, Chalfont St Giles, Bucks. (L.)
- Ewart, J., F.Z.S. (Scot.) (1601), Silvermount, Old Inverkip Rd., Greenock, Renfrewshire. (gen. ent.)
- Ewing, K. W. (1121), Castleway, Calne, Wilts. (L. esp. breeding)
- Fairbairn, W. J., B.Sc. (443), Northfields, St Abbs, Berwickshire. (B., L., conchology)
- Fairclough, R. (528), Blencathra, Deanoak Lane, Leigh, Surrey. (L., ornith.)
- Fairey, K. D. (970), Griffith St., Charlestown, New South Wales, Australia. (C., H., L., gynandromorphs)
- Farwell, I. G. (1445), The Haven, Portmore, Lymington, Hants. (L.)
- Fearnhough, T. D. (47), 25 Ramsey Rd., Sheffield 10.
- Featherstone, C. (1490), Rhode Common, Dunkirk, nr. Faversham, Kent. (gen. ent.)
- Ferguson, E. A. (1311), 1213 Bellflower Ave. S.W., Canton 4, Ohio, U.S.A. (L.)
- Ferneley, W. H. (1540), Frogs Hall, Waltham, nr. Canterbury, Kent.
- Ferry, R. S. (207), Fulling Mill House, Welwyn, Herts. (gen. ent., L.)
- Fidler, Dr J. H. (1256), 2 Fulford Court, Naburn Lane, York. (Trichoptera, aphididae)
- Field, G. N. (1000), 14 Mitchley Grove, Sanderstead, Surrey. (L.)
- Fincher, F. (1076), Randan Wood, Woodcote, Bromsgrove, Worcs. (Orthoptera, O., R., H.)
- Finlay, J. F. (806), The Gables, Honiton, Devon. (L.)
- Finlay, Capt. R. A. L., M.B.E. (229), 9 Hermitage Gdns., Edinburgh 10. (gen. ent.)
- Firth, J. D., F.S.A. (1210), 347 Otley Rd., Leeds 6. (gen. ent.)
- Fisher, J. M., M.A. (1305), Old Rectory, Ashton, Northampton. (L.)
- Flelo, F. E. C. (1587), 28 Church St., Buckingham. (L.)
- Fluck, G. G. (569), Redroof, Reading Rd., Fleet, Hants. (L.)
- Ford, Rev. G. A. (377), Balsham Rectory, Balsham, Cambs. (L.)
- Foss, P. W. (1620*), 15 Court Rd., South Norwood, London S.E.25. (L.)
- Fountain, H. G. (1498*), 116 Ralph Rd., Birmingham 8. (L.)
- Fox, K. J. (1459*), 20 Scotsdale Rd., London S.E.12. (L.)
- Fox, T. H. (105), 226 St Albans Rd., Watford, Herts. (L., breeding)
- Francis, B. (1145), 12 Highbury Rd., Bury St Edmunds, Suffolk. (H.)
- Fray, E. A. (1628), Merry Gardens, Chapel Rd., West End, Southampton, Hants. (L.)
- Freeman, J. A., Ph.D. (986), 5 Woodmere Way, Beckenham, Kent. (stoned products ent.)
- Fretwell, S. (1225), 121 Highbury Quadrant, London N.5. (Rearing silkmoths and hawkmoths)
- Gain, L. A. (1449), 1544 Spruce St., Berkeley, California, U.S.A. (gen. ent.)
- Gamble, Miss W. (1127), 21 Albert Cres., Bury St Edmunds, Suffolk. (gen. ent.)
- Gandell, P. (1173*), 103 Brunswick Rd., London W.5. (gen. ent.)
- Gardiner, B. O. C. (225), 34a Storeys Way, Cambridge. (L., gen. ent., neuroptera)
- Garrett-Jones, C. (989), Houseboat Hilara, c/o Rye House Farm, Hoddesdon, Herts. (L., D.)
- Garstang, Miss D. M., N.D.H. (622), Studley College, Studley, Warwickshire. (gen. ent., econ. ent., L., H.)

- Gay, P. A. (1393*), School House, Hartbury, Gloucester. (L., C., D., H.)
- Gent, Mrs G. M. (642), 3 Union Rd., Wellingborough, Northants. (gen. ent., botany, ornith., geology)
- Gent, P. J. (192), 3 Union Rd., Wellingborough, Northants. (L.)
- George, R. S. (1402), St John's County Girls' School, Canterbury, Kent. (B., bryology)
- Gerard, Hon. R. (359), Blakesware, Ware, Herts. (L.)
- Gibbs, G. W. (1212*), c/o Dr Mary Blair, 44 Denbigh St., London S.W.1. (gen. ent.)
- Gibson, Miss E. M. (311), 54 Station Rd., Petersfield, Hants. (L.)
- Gilbert, A. E. H. (1631*), 5 The Avenue, Hatch End, Mddx. (L.)
- Gilmour, E. F., F.R.E.S. (870), East View, Pickford St., Milnsbridge, Huddersfield, Yorks. (C., esp. Longicornia of world)
- Gilson, J. R. (1529), Burrough on the Hill, Melton Mowbray, Leicester. (L., H.)
- Glanz, A. (1463), 289 East 98th St., Brooklyn, New York, U.S.A. (L.)
- Glennie, Brig. E. A. (1102), Steepways, Cross Oak Rd., Berkhamstead, Herts. (Troglophils, troglodytes)
- Goddard, T. D., F.R.E.S. (841), Long Hoyle Farm, Heyshott, Midhurst, Sussex. (L.)
- Golby, W. A. (1412), 136 Milner Rd., Birmingham 29. (gen. ent.)
- Golding, D. P. (904), 517 Foots Cray Rd., London S.E.9. (L.)
- Goodall, Miss M. D. (807), 47 Stratford Ave., Ryhope Rd., Sunderland, Co. Durham. (L., aq. ent., garden insects)
- Goodbody, G. (1470), 284 Baring Rd., London S.E.12. (L.)
- Goodman, A. de B. (920), 20 Brooklands Ave., Cambridge. (gen. ent.)
- Goodwin, R. J. C. (1551), The Elms, Chislehurst Rd., Sidcup, Kent. (L.)
- Goody, J. K. (954), 26 Carr Wood Rd., Bramhall, Cheshire. (L., breeding esp. exot. Saturniidae, tropical aquaria, herpetology, exot. botany)
- Gorer, Dr P. A. (676), 3 Fairway Close, Wildwood Rd., London N.W.11. (L. genetics and local variation)
- Gorer, R. (659), Little Pett Farm, Bridge, nr. Canterbury, Kent. (L.)
- Goulding, D. (1291), 81 New St., New Mills, nr. Stockport, Cheshire. (gen. ent. esp. L.)
- Gowing-Scopes, E. (909), Oakhurst, Oakwood Rd., Crofton, Orpington, Kent. (L., C.)
- Graham, E. W. (1142), Windy Ridge, Little Widbury, Ware, Herts. (L.)
- Grant, F. T. (276), 37 Old Rd. West, Gravesend, Kent. (C., L.)
- Grattan, Miss S. E. G. (1581*), 9 Wolverton Ave., Kingston Hill, Surrey. (L.)
- Graves, J. E. (1557*), 21 Christian St., Maryport, Cumberland. (H.)
- Green, J. (1044), 61 Ruskin Rd., Crewe, Cheshire. (C., gen. ent.)
- Greenwood, F. D. (1280), Solefield Lodge, Sevenoaks, Kent. (L.)
- Greenwood, R. S. (757*), 22 Maidstone Rd., Rochester, Kent. (L.)
- Greig, Major G. D. S. (10), 29 Highcroft Ave., Bebington, Wirral, Cheshire. (L.)
- Griffiths, G. (1217), Adwy Goch, Blaenau Festiniog, Merionethshire. (gen. ent., parasites)
- Grimwood, K. W. (1625), 20 Lancing Rd., Newbury Park, Ilford, Essex. (L.)
- Haggett, G. M. (1200), 1 Torton Hill, Arundel, Sussex. (L., gen. ent.)
- Hague, N. G. (943), 39 Heath Drive, Potters Bar, Mddx. (L., O.)
- Hall, D. W. (1088), Zoology Dept., University College, Dundee. (gen. ent.)
- Hall, Rev. J. H. V. (1520), St Peter's Vicarage, Kells, Whitehaven, Cumberland. (L.)
- Ham, B. J. (1327), Mona, Kings Saltern Rd., Lymington, Hants. (L.)
- Hammond, H. E., F.R.E.S. (423), 16 Elton Grove, Birmingham 27. (L., ML., C., gen. ent., life-histories of L.)
- Handfield-Jones, R. M., M.C., M.S., F.R.C.S., F.R.E.S. (1539), 149 Harley St., London W.1.
- Hanlon, G. T. (504), 6 Arlington Gdns., Ilford, Essex. (L.)
- Hanson, A. R. (1500), 167 Gunnersbury Pk., Pope's Lane, London W.5. (L., gen. ent.)
- Hanson, S. M. (320), 167 Gunnersbury Pk., Pope's Lane, London W.5. (L.)
- Harding, C. J., B.Sc. (894), BM/NEWT, London W.C.1. (B.)
- Hardman, J. A. (1234), 10 Hands Lane, Bury Rd., Rochdale, Lancs. (gen. ent., L., ML., NH., botany, ornith.)

- Hards, C. H. (176), 40 Riverdale Rd., London S.E.18. (L., mic.)
- Hardy, M. G. (1541), 15 Belbroughton Rd., Oxford. (L., C., gen. ent.)
- Harle, D. F. (889), The Studio, Strand St., Sandwich, Kent. (E.)
- Harman, I. (1594), 150 Hither Green Lane, London S.E.13. (L.)
- Harper, Comdr. G. W., R.N. (1169), Bramblewood, Bushby Ave., Rustington, Sussex. (L., gen. ent.)
- Harper, M. W. (1553*), Bramblewood, Bushby Ave., Rustington, Sussex. (L., gen. ent.)
- Harrison, G. (1556), 12 Belgrave Ave., Flixton, Manchester. (L. variation)
- Harrison, Prof. J. W. Heslop, D.Sc., F.R.S., F.R.E.S. (716), Gavarnie, The Avenue, Birtley, Co. Durham. (gen. ent., L., Biogeography)
- Harwood, N. W. (825), 37 Stoneyhurst Ave., Acklam, Middlesbrough, Yorks. (L., P.)
- Harwood, P. (273), Ardinsh, Kinncraig, Inverness-shire. (C., Hem.-Hom., H., aculeata)
- Haslam, J. (960*), 1020 Bristol Rd., Birmingham 29. (R.)
- Hatcher, F. L. (1441), 18 St Edmunds Drive, Stanmore, Mddx. (L., D.)
- Hawdon, A. S., B.Sc. (1469), 47 Keslake Rd., London N.W.6. (L.)
- Haxby, C. R. (1508), 4 Windermere Terrace, Great Horton, Bradford, Yorks. (L.)
- Haynes, R. F. (834), Lyndhurst, Brockham Lane, Betchworth, Surrey. (L., gen. ent., botany)
- Haynes, R. G. (1545), 5 Lucas Terrace, Lucas Lane, Plympton, Plymouth, Devon. (L.)
- Heaman, J. C. (1430*), Gulland, Dulverton, Som. (L.)
- Heard, M. J. (595), 36 Exford Rd., London S.E.12. (L. esp. genetics)
- Heley, R. G. (731), Lygoes, Burcott, Wing, Leighton Buzzard, Beds. (L. including exot., botany)
- Hellings, G. E. A. (297), 49 Wheat-sheaf Close, Woking, Surrey. (L.)
- Henderson, C. W. (21), 124 Knightthorpe Rd., Loughborough, Leics. (C., Brit. and exot.)
- Henderson, R. J. (1616*), 12 Herbert Rd., London S.E.18. (L.)
- Henshaw, E. J., B.Sc. (692), 58 Berwyn Grove, Maidstone, Kent. (L., horticultural ent.)
- Henstock, Dr H., Ph.D., M.Sc., F.I.C. (209), Glengariff, Caerwys, Mold, Flintshire. (L.)
- Heslop, Miss V. L. M. (835), Villa Aice-choko, Route des Dunes, St Jean-de-Luz (B.P.), France. (agric. insect pests, C.)
- Hewson, F. (601), 23 Thornhill Drive, Shipley, Bradford, Yorks. (L.)
- Hick, A. E. (567), Sherrards, Cricket Field Lane, Bishop's Stortford, Herts. (O., H.)
- Hick, E. Pentland, F.R.E.S. (141), Athol House, Fulford Rd., Scarborough, Yorks. (exot. L.)
- Hill, A. R., B.Sc., F.R.E.S. (1043), 3 Ferngrove Ave., Kelvindale, Glasgow W.2. (Insect E. esp. aq., Hem.)
- Hill, G. H. (164), c/o S. A. Azamón, Córcega 303, Barcelona, Spain. (L.)
- Hill, R. J. (1505), 31 Holland Rd., Luton, Beds. (L.)
- Hillaby, J. D., F.Z.S., F.R.E.S. (1492), 85 Chomley Gdns., N.W.6. (C., H.)
- Hilliard, R. (99), 54 Gyles Park, Stanmore, Mddx. (L., NH.)
- Hincks, W. D., M.P.S., F.R.E.S. (531), 19 Whitefield, Heaton Norris, Stockport, Cheshire. (gen. ent., C., Orthoptera, Dermaptera, nomenclature)
- Hine, D. J. (1579*), 14 Vale Rd., Northfleet, Gravesend, Kent. (gen. ent. esp. Hem., L., C.)
- Hirons, M. J. (444), 41 Kelvin Ave., Wyken, Coventry, Warwickshire. (L. mic.)
- Hitchens, P. E. N. (669), Sickiebank, Horam, Sussex. (L. esp. temperature trials on pupae)
- Hobbs, P. E. (1435), Beryl, Wells, Som.
- Hobday, C. A. (1538), The Hollies, Wilsthorpe Rd., Breaston, Derbyshire. (L., C.)
- Hodge, W. H. (878), 28 Mortlock Ave., Chesterton, Cambridge. (L.)
- Hodges, G. B. (314), 12 London Rd., Braintree, Essex. (L.)
- Hodgson, F. L. (580), 9 Ennerdale Drive, Bolton, Bradford, Yorks. (L.)
- Hodson, E. V. (1392), 19 Stamford Rd., West Bridgford, Nottingham. (L.)
- Hodson, L. S. (851), Littlestowe, Esendon, Herts. (gen. ent.)
- Holden, N. E. S. (1151*), Ingle Nook, Alexandra Rd., Abergele, Denbighshire.
- Holloway, P. H., F.R.E.S. (429), Warwick House, Fair Oak, Eastleigh, Hants. (R.)

- Holmes, A. M. (1198), 11 Grotto Rd., Rondebosch, Cape Town, S. Africa. (L.)
- Holroyd, E. M. (1139*), Arlon, Parkway, Wilmslow, Cheshire. (L.)
- Holroyd, G. C. (253), 8 Elmside, Onslow Village, Guildford, Surrey. (L.)
- Holt, Miss M. (1550), 52 Grove Lane, Hale, Altrincham, Cheshire. (L., gen. ent.)
- Honeybourne, T. J. (1558), 97 Birchwood Rd., Wilmington, Dartford, Kent. (L.)
- Hood, L. A. (526), Orchard Cottage, Tolleshunt Major, Essex. (L.)
- Hope Professor, The (666), Hope Dept. of Entomology, University Museum, Oxford. (Bionomics)
- Hopkins, Miss B. A. (827), 52 Grove Ave., Harpenden, Herts. (L. breeding)
- Horder, A. (85), Buchan Hill Nursery, Crawley, Sussex. (L., M.)
- Horner, L. B. (917), 66 Balckaw St., Guisborough, Yorks. (gen. ent.)
- Horsley, H. P. (1624*), 40 Bath St., Ipswich, Suffolk. (C., L.)
- Horton-Ormerod, S. (1370), 17 Kenwood Rd., Moss Bank Park, Bolton, Lancs. (arachnology)
- Howarth, T. G., B.E.M., F.R.E.S., F.Z.S. (1627), Dept. of Entomology, British Museum (Nat. History), Cromwell Rd., London S.W.7. (L.)
- Hubbard, Capt. E. H. T., R.N. (1061), Conroy House, Mundesley, Norfolk. (L.)
- Humphrey, S. W. (386), Pear Tree House, Roade, Northants. (R.)
- Hunking-Molyneux, W. (1297), Greenhill, Afonwen, Caerwys, Flintshire. (gen. ent.)
- Hurrell, F. J. (923), 46 Goldlay Ave., Chelmsford, Essex. (L.)
- Hurst, A. (1618), The Garage, Guildford Rd., Cranleigh, Surrey. (L.)
- Hutcheson, Flt./Lt. D. (919), 246 Muirhall Rd., Larbert, Stirlingshire. (World R. esp. Brit. and European)
- Hyatt, K. H. (1411*), 3 Kidbrooke Gdns., London S.E.3. (L.)
- Hyde-Wyatt, B. (1548), 9 Shrubland Grove, Worcester Park, Surrey. (gen. ent. esp. O., L., H.)
- Hynes, Mrs V. D. P. (686), 152 Meachem Ave., Battle Creek, Michigan, U.S.A. (silk moths)
- Ilse, Dr D. (1575), 193 Warwards Lane, Birmingham 29. (Eristalis, L.)
- Ireland, M. (1526*), 72 Days Rd., Bristol 5. (gen. ent.)
- Irwin, R. R. (1220), 411 North Bloomington St., Streator, Illinois, U.S.A. (R.)
- Ison, C. H. (1343), 47 Orford Rd., London E.17. (gen. ent. esp. Saturniidae, mic., P. including photomicroscopy)
- Jackson, Miss D. J., F.L.S., F.R.E.S. (1124), North Cliff, St Andrews, Fife. (gen. ent., C., H.)
- Jackson, S. M. (1269), 15 Westbourne Rd., Selby, Yorks. (L.)
- Jackson, W. W. (619), 18 Belmont Rd., Aberdeen. (L.)
- James, W. H. (120), 41 Carson Rd., London S.E.21. (L. esp. R., Sphingidae)
- Janes, J. A. (614), 1 Ailsa Terrace, Tiverton, Devon. (L.)
- Jaques, F. A. (1314), 58 Clifton Gdns., London N.W.10. (gen. ent., P.)
- Jarvis, C. Mackechnie, F.L.S. (650), 15 Kingcroft Rd., Harpenden, Herts. (C., econ. ent.)
- Jefferson, T. W. (242), 37 Riversdale Terrace, Sunderland, Co. Durham. (R.)
- Jeffreys, Dr D. M., M.B., B.Ch. (Cantab.) (615), 116 Hurst Grove, Bedford. (L., ornith., gen. ent.)
- Jeffs, G. A. T. (910), Nuns Holm, Nuns Corner, Grimsby, Lincs. (gen. ent.)
- Jesper, D. M. (1152), 23 Woodlands Grove, Harrogate, Yorks. (L., C., H., beekeeping)
- Johnson, J. H. (1040), 53 Knighton St., Hephthorne Lane, nr. Chesterfield, Derbyshire. (C., H.)
- Jones, A. W. (1165), 99 Ashmore Rd., London W.9. (D.)
- Jones, P. (1006), Coplands, Walderslade Rd., Chatham, Kent. (gen. ent.)
- Keji, J. A. (571), Biggs Memorial Hospital, Ithaca, N.Y., U.S.A. (L. larvae, esp. Saturniidae, Notodontidae, Eucleidae)
- Kemp, J. H. (1161), 104 Oxstalls Lane, Gloucester. (aq. ent.)
- Kenington, F. E. (1549), Lodge Farm, Benningholme Lane, Skirlaugh, nr. Hull, Yorks. (D., C., gen. ent.)
- Kennedy, A. (20), 130 Vesper Rd., Leeds 5. (L.)
- Kerr, M. A., M.B.E. (1609), Olinda, Golf Links Rd., Ferndown, Wimborne, Dorset. (L.)
- Kerrich, G. J., M.A., F.R.E.S. (551), Heath Crest, Westcott, Dorking, Surrey. (H. parasitica)
- Keyes, J. B. (1603*), 11 Gunners Grove, Chingford, E.4. (L.)

- King, A. Roland (425), Walworth House, Thirlestaine Rd., Cheltenham, Glos. (L.)
- Kloet, G. S., F.Z.S., F.R.E.S. (477), 8 Knutsford Rd., Wilmslow, Cheshire. (gen. ent., nomenclature)
- Knight, John E. (94), Doughton Cottage, Ross-on-Wye, Herefordshire. (L. rearing)
- Knight, Major Maxwell, O.B.E., F.R.M.S., F.L.S. (956), The Homestead, Park Rd., Camberley, Surrey. (aq. ent., moths, mic.)
- Krauss, N. L. H. (1471), 2437 Parker Place, Honolulu 5, Hawaii. (Trypetidae)
- Lake, E. R. (868*), Hertford Constitutional Club, Lombard House, Hertford. (L.)
- Lanfear, A. H. (74), 20 South Eastern Rd., Ramsgate, Kent. (L.)
- Langford, P. G. (1630), 7 London Rd., Widley, Portsmouth. (L.)
- Langley, R. (1273), 100 Wickham Lane, London S.E.2. (H., hawk-moths)
- Last, H. R. (117), 12 Winkworth Rd., Banstead, Surrey. (C. esp. Brit. and foreign Staphylinidae)
- Latham, J. W. (1574*), 51 Park Drive, Grange Park, London N.21. (Orthoptera, O., L.)
- Ia Touche, Dr A. A. D. (884), 21 Alwoodley Gardens, Moortown, Leeds. (Spiders)
- Leeds, H. A. (282), Wood Walton, Hunts. (L. esp. R. vars.)
- Lees, F. H. (375), The Gables, Maidencombe, Newton Abbot, Devon. (L.)
- Le Fleming-Forbes, Mrs W. M. (1105), 32 Trebovir Rd., London S.W.5. (L.)
- Le Masurier, P. C. (978), 85 Warren Drive, Tolworth, Surrey. (L.)
- Leonard, B. G. (96), 29 Storeton Rd., Oxtou, Birkenhead, Cheshire. (L., hawkmoths)
- Leston, D., F.R.E.S., F.Z.S. (1589), 1 Abbey Court, Abbey Rd., London N.W.8. (Het.)
- Lewis, E. (952), 8 Parry Rd., London S.E.25. (C.)
- Lewis, Rev. E. S. (373), Berwyn, Rhuddlan, Flintshire. (L.)
- Lewis, R. (734), Electric House, Queen St., Withernsea, Yorks. (O., botany)
- Liddell, Lady H. G. (1531), Manor House, Finchampstead, Berks. (midges, pond life)
- Lisney, A. A., M.A., M.D., F.R.E.S. (315), Dune Gate, Clarence Rd., Dorchester, Dorset. (L., ML.)
- Little, E. R. B. (1546*), 59 Lockesley Drive, St Mary Cray, Orpington, Kent. (L.)
- Little, J. C. (563), 70 Langley Way, West Wickham, Kent. (L. including exot.)
- Llewellyn, J. M. (1249), 200 Heathwood Rd., Cardiff, Glam. (C.)
- Lloyd, Major Chas. T., D.Sc., Ph.D. (468), 25 Belmont Ave., New Malden, Surrey. (L., ML., microphotography, ornith.)
- Lloyd, L. C., F.L.S., M.B.O.U. (770), Shackerley, Wenlock Rd., Shrewsbury, Shropshire. (E.)
- Lloyd, R. W. (445), Treago Castle, St Weonards, Hereford. (C.)
- Lobb, J. (1608), Fernbank, Yarborough Rd., Wroxall, I. of Wight. (gen. ent.)
- Locke, M. (1118), 36 Ainsdale Rd., London, W.5. (L., botany, mic., Z.)
- Lockington, N. A. (1421), 24 Beaufort Gdns., London N.W.4. (C., H.)
- Long, Miss L. M. (698), White House Farm, Somerleyton, via Lowestoft, Suffolk. (L. rearing, gen. ent.)
- Long, W. H. (1565), Ashleigh, Limes Rd., Tettenhall, Wolverhampton, Staffs. (L.)
- Longfield, Miss Cynthia, F.R.E.S. (1039), 11 Iverna Gdns., London W.8. (O.)
- Lorimer, Dr J. A. (576), 23 King's Ave., Buckhurst Hill, Essex. (L.)
- Lorimer, R. I. (600), Braeside, Pine Grove, London N.20. (L.)
- Lothian, D. M. (964), Backhill Cottage, East Hallside, Cambuslang, Glasgow. (L., C.)
- Lowther, Dr R. C. (1024), Fernleigh, Grange-over-Sands, Lancs. (L., phenological dates, NH.)
- Ludlam, R. (1519*), 58 Lulworth Ave., Lampton, Hounslow, Middx. (L.)
- Luscombe, Miss B. (815*), Puriton Manor, Bridgwater, Som. (L.)
- Lydgate-Bell, H. G. (1176), 28 Hastings Way, Croxley Green, Herts. (L.)
- Lyon, F. H. (1026), Green Headland, Sampford Peverell, Tiverton, Devon. (L.)
- McCartney, G., F.R.E.S. (1347), Beechgrove, Kirkpatrick - Durham, by Castle-Douglas, Kirkcudbrightshire. (H.)
- McClare, D. A. F. (1448*), 13 Conway Rd., Allington, nr. Maidstone, Kent. (L., silk moths)
- Maclaurin, A. M. (1282), Oldhall-house, Kilmacolm, Renfrewshire. (gen. ent.)

- McCrae, A. W. R. (1144*), Oak Lawn, Gordon Ave., Stanmore, Mddx. (C., L.)
- McCurdy, Dr J. M., M.R.C.S., L.R.C.P. (1270), 161 Wigan Rd., Ashton in Makerfield, Lancs. (L.)
- Mackworth-Praed, Lt. Col. C. W. (392), Castletop, Burley, Hants. (ent., Z., ornith.)
- McLeod, Sir Murdoch, Bt. (35), Culverlea House, Pennington, Lymington, Hants. (L.)
- McNally, P. (1429), 11 Tennant Rd., Paisley, Renfrewshire.
- Macnicol, Dr D. A. B. (67), 52 St Albans Rd., Edinburgh 9. (L., ML., P.)
- Maggs, P. (244), Sibylla, East End, Lymington, Hants. (L.)
- Major, A. P. (1117), 21 Tufton Rd., Rainham, nr. Gillingham, Kent. (NH., gen. ent.)
- Manly, G. B. (427), 72 Tenbury Rd., King's Heath, Birmingham. (L.)
- Mansfield, M. J. (134), 5 Chigwell Rd., Bournemouth, Hants. (gen. ent.)
- Marchant, I. D. (1544*), 56 Woodside Court Rd., Addiscombe, Croydon, Surrey. (L.)
- Marsden, P. D. (1292*), 126 Firs Lane, London N.21. (L.)
- Marshallsay, F. C. (1272*), 23 High Street, Fordington, Dorchester, Dorset. (L., C., H.)
- Marson, J. E., F.Z.S., F.R.E.S. (1390), 35 High Park Drive, Heaton, Bradford, Yorks. (pond life, mic., spiders)
- Martin, E. L. (801), 9 Devonshire Rd., Harrow, Mddx. (L. esp. ML., Trichoptera)
- Martin, W. A. (553), Longcause, Totnes, Devon. (L.)
- Max, G. T. (1461*), Godrevy, Malpas Road, Newport, Mon. (L.)
- May, A. V. (1128), 42 Whitehall Gdns., London E.4. (gen. ent. esp. L.)
- Mead, W. J. (1578), 58 Cedar Lawn Ave., Barnet, Herts. (L.)
- Mellows, W. T., M.B.E., LL.B., F.S.A. (302), The Vineyard, Minster Precincts, Peterborough, Northants. (L.)
- Melrose, Dr M. M., M.D. (723), Wargrave House, St Owen St., Hereford. (L. esp. ML.)
- Melville, Dr R., Ph.D., F.L.S. (903), Royal Botanic Gardens, Kew, Surrey. (H., beekeeping, botany)
- Menlove, Miss E. M. (1604*), Haverling, Sandy Lodge, nr. Northwood, Mddx. (O., L.)
- Menzies, I. S. (585), Eden Roc, Florida Rd., Ferring-by-Sea, Sussex. (L., ML., C., H.)
- Michaelis, H. N. (1216), 10 Didsbury Park, Manchester 20. (L. including Indian R.)
- Miles, B. R. (1613*), 303 Selsdon Rd., South Croydon, Surrey. (L.)
- Millard, W. J. (80), 8 York Place, Clifton, Bristol, 8. (gen. ent., L., pond life)
- Miller, F. C. (1223), 7 Gabriels Hill, Maidstone, Kent. (L.)
- Miller, S. W. (1287), 5 Bedford Terr., Portobello, Midlothian (L.)
- Millon, R. (1496), 73 Rue Jenner, Fives-Lille, Nord, France. (gen. ent.)
- Mills, Miss D. (354), Blendon Preparatory School, Bexley, Kent. (L.)
- Mills, H. C. (1228), Thornycroft, Greenway, Hutton Mount, nr. Brentwood, Essex. (H., L.)
- Molyneux, S. R. (1180), 40 Coxford Rd., Maybush, Southampton, Hants. (gen. ent., esp. C.)
- Moody, B. W. (1570*), Amesbury, Hele Manor, Barnstaple, Devon. (L.)
- Moody, N. H. (693), 119 Southampton Rd., Ringwood, Hants. (L.)
- Moore, D. M. (1248*), Thom Hill House, Prospect Place, Barnard Castle, Co. Durham. (L. gen. ent.)
- Moore, John (146), Kemerton Lodge, nr. Tewkesbury, Glos. (L.)
- Morgan, H. G., M.A. (90), Staplake Mount, Starcross, Exeter, Devon. (Hem. esp. aphides, aq. Het., E., gen., econ., and agric. ent.)
- Morgan, J. R. (1515), 12 The Grove, Ringstead, Kettering, Northants. (L.)
- Morton, J. K. (522), 26 Argyle Sq., Sunderland, Co. Durham. (L.)
- Morton, Miss M. E. (924*), 20 Leeds Rd., Barwick-in-Elmet, Leeds, Yorks. (L. mic.)
- Moss, B. T. M. (1335), 12 The Bungalows, Windmill Rd., Halstead, Essex. (H., L.)
- Murchie, W. R. (634), Box 203 Sharon, Pennsylvania, U.S.A. (L., gen. ent., Z.)
- Murdy, P. S. (979*), 193 Coombe Lane, London S.W.20. (L.)
- Murray, Dr H. (177), Ashbourne, Clonmel, Co. Tipperary, Eire. (L.)
- Nathan, L. (428), 19 Monton St., Moss-side, Manchester 14. (ent., L.)
- Neal, E. G., B.Sc. (467), 2 Bishop's Mead, Kingston Rd., Taunton, Som. (L., C., Hem., P.)

- Neal, P. G. (1103), 177 Braemore Rd., Goodmayes, Essex. (L.)
- Ness, A. R. (549), 15 Homefield Ave., Newbury Park, Ilford, Essex. (L.)
- Nestel, B. L. (1362*), 31 Filey Ave., London N.16. (gen. ent., L.)
- Newland, R. M. (1454*), Geraldene, Watton Rd., Knebworth, Herts. (L.)
- Newlands, M. J. (1475), 20 Julians Rd., Stevenage, Herts. (L.)
- Newman, D. E. (65), 15 Strafford Rd., High Barnet, Herts. (R.)
- Newman, E. T. (1621), Hollyhocks, Guildford Rd., Cranleigh, Surrey. (R.)
- Newman, L. Hugh (503), The Butterfly Farm, Bexley, Kent. (L.)
- Newson, P. (842), Ridheugh, West End Ave., Guisborough, Yorks. (L.)
- Newton, A. H., M.B., Ch.B., F.R.E.S., (1140), Charles Johnson Memorial Hospital, Ngutu, Zululand, S. Africa. (O., C.)
- Newton, J. (439), 11 Oxleaze Close, Tetbury, Glos. (L.)
- Nissen, L. C. (1386*), The London Choir School, Bexley, Kent. (L., C.)
- Norman, Dr T. (68), Seleng T.E., Seleng-Hat P.O., Upper Assam, India. (H., L., D., parasites of L.)
- North, R. S. (654), 41 Buckinghamham Rd., Aylesbury, Bucks. (L.)
- Nunn, G., M.A., B.Sc., A.R.I.C. (1149), Senior Lecturer in Science, Oakley Training College for Men, Cheltenham, Glos. (gen. ent.)
- Ogden, J. B. (1580), Willow House, Cote Hill, Burnley Rd., Halifax, Yorks. (L. genetics)
- Ogden, J. S. (1070), Argwendon, Green St., Sunbury-on-Thames, Middx. (L., C.)
- Ogden, W. S. (1018), South Lodge, Reading Rd., Cholsey, Berks. (L.)
- Ollevant, D. (1514), 172 Stockwell Rd., London S.W.9. (L.)
- O'Rourke, F. J. (191), Department of Entomology and Parasitology, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool 3. (H.)
- Otter, G. W. (475), Southwood, Blandford Rd., Broadstone, Dorset. (L., C., Trichoptera)
- Owers, D. E. (1319), 114 Demesne Rd., Wallington, Surrey. (L., C., O.)
- Owston, E. (1334*), 17 Avenue Rd., Scarborough, Yorks. (L.)
- Padron, A. G. (1560), Primo Rivera 23, Santa Cruz de Tenerife, Canary Islands. (C.)
- Page, Miss B. (1321), The Gables, Cookham Dean, Berks. (L., Ornith.)
- Page, E. S. (598), The Gables, Cookham Dean, Berks. (L.)
- Page, R. L. S. (742), Abbots Gate, Falcon Gdns., Minster, Sheppey, Kent. (gen. ent.)
- Palmer, J. L. (900), Editor-in-Chief, Western Morning News Co. Ltd., Leicester Harmsworth House, 8/10 Frankfort St., Plymouth. (Organisation of entomological and phenological returns)
- Park, F. B. (1329), 7 The Chilterns, Brighton Rd., Sutton, Surrey. (H.)
- Parker, C. F. (803), 61 Winchcomb Gdns., London S.E.9. (L., mic.)
- Parker, E. (865), Feathercombe, Hambledon, Godalming, Surrey. (M.)
- Parker, H. (738), 21 Park Way, Southwick, Sussex. (gen. ent., NH.)
- Parker, P. G. (1397), Green Acre, Bristol Rd., Quedgeley, Gloucester. (gen. ent.)
- Parker, R. A. B. (1535), 63 Rainham Rd., Gillingham, Kent. (gen. ent.)
- Parmenter, L., F.R.E.S. (895), 94 Fairlands Ave., Thornton Heath, Surrey. (D.)
- Parsons, R. E. R., F.R.E.S. (1512), Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. (L.)
- Parsons, T. (1513*), 28 St Johns St., Ogmere Vale, Bridgend, Glam. (L.)
- Pattman, J. H. (1481), The Croft, nr. Padworth, Reading, Berks. (L.)
- Pauley, R. C. (572), c/o Dr R. J. Pauley, Stirling Winthrop Research Lab., Reusselaer, New York. U.S.A.
- Payne, J. H. (353), 10 Ranelagh Rd., Wellingborough, Northants. (L.)
- Peace, H. A., F.R.E.S., F.R.M.S. (680), Kiln Rd., Hastoe, Tring, Herts. (R., bees, wasps, mic., pollen)
- Pearce, Rev. E. J., M.A., F.R.E.S. (796), St Teilo's Priory, Church Terrace, Roath, Cardiff. (C. and their distribution esp. Halipidae, Pselaphidae)
- Pedley, J. (1524*), 100 Letchmore Rd., Stevenage, Herts. (aq. ent.)

- Peel, D. H. (1218), 7 Bushway, Dagenham, Essex. (British and exot. R.)
- Pellham-Clinton, E. C. (1399), Gland-yfi Castle, Machynlleth, Montgomeryshire. (L.)
- Pellatt, J. J. K. (338), 45 Maple St., Sheerness, Kent. (L.)
- Pennock, E. T. (82), 16 Drive Rd., Linthouse, Glasgow S.W.1. (L.)
- Penrose, R. J. (1467*), 86 Mildred Ave., Watford, Herts. (L.)
- Perkins, L. (1464), 21 East Dulwich Grove, London S.E.22. (C., H., D.)
- Perrins, C. M. (1133*), Thursday Cottage, Ember Lane, Esher, Surrey. (L.)
- Petty, G. R. (1113), 106 King's Rd., Rayners Lane, Harrow, Middx. (gen. ent.)
- Petty, K. (1561*), 21 Princess Cres., Bolton, Bradford, Yorks. (L.)
- Phebey, P. R. (1293), 45 Willrose Cres., London S.E.2. (L., H., C.)
- Pickering, E. C. (1243), 31 Alexandra Drive, Surbiton, Surrey. (H.)
- Platts, J. H. (515), Lawn Cottage, Sway Rd., Brockenhurst, Hants. (L.)
- Podmore, Miss J. S. (1607*), 23 King's Close, Wilmslow, Cheshire. (gen. ent.)
- Pook, J. (1596*), The Gate, Stroud Farm Rd., Holyport, nr. Maidenhead, Berks. (L.)
- Poole, K. H. (133), 55 The Boulevard, Weston-super-Mare, Somerset. (L.)
- Port, M. H. (799), 31 Pinner View, Harrow, Middx. (L., Orthoptera)
- Potter, C. W. (214), 10 Fern Rise, Garden City, Humberstone, Leicester. (L.)
- Pow, A. (39), 5 Dakers Place, Hawick, Roxburghshire. (L.)
- Pratt, C. B. (784), 1 West Ham Lane, London E.15. (L.)
- Price, L. (1478), 61 South Drive, Manchester 21. (L., C.)
- Price, Miss P. D. (993), 22 Tudor Way, London N.14. (gen. ent.)
- Prichard, R. (460), 4 Woodcroft Lane, Bebington, Cheshire. (L. ML.)
- Pullen, G. H. (1622), 36 Firlands Scott Rd., Bishop's Stortford, Herts. (C., orthoptera, mic.)
- Purvis, L. E. (941), One Oak, Hale Rd., Hale Barns, Cheshire. (L.)
- Putnam, C. D. (1383), Davenants, Sible Hedingham, Halstead, Essex. (gen. ent.)
- Ralph, J. E. G. (1177), 48 Teapot Lane, Aylesford, Kent. (gen. ent.)
- Ramsay, F. J. (837), Old Manse, Kilbarchan, Renfrewshire. (gen. ent.)
- Ramsden, E. (130), Flat No 1, Glenburn, Calverley Lane, Horsforth, nr. Leeds. (L.)
- Randall, M. C. (535), 64 Mount Pleasant Rd., Chigwell, Essex. (L.)
- Ranger, J. E. A. (1002), 54 Cherry Cres., Brentford, Middx. (Locusts, L.)
- Raven, L. (135), 196 Culson Rd., Coventry, Warwickshire. (L.)
- Ray, D. J. (679*), Mill House Cottage, Bishopstoke, Hants. (ent., R., M., ornith.)
- Ray, H. (678), Mill House Cottage, Bishopstoke, Hants. (phototropic behaviour of insects)
- Raybould, J. N. (1302*), 8 Ember Farm Ave., E. Molesey, Surrey. (gen. ent.)
- Read, E. C. (855), Stoney Corner, Meopham, Kent. (NH.)
- Readwin, B. (820), 36 Warley Hill, Brentwood, Essex. (gen. ent.)
- Redmayne, M. I. (1041), The Long House, Great Alne, nr. Alcester, Warwickshire. (L., H., P.)
- Rees, D. A. (1184*), 98 Eden Way, Beckenham, Kent. (L.)
- Reid, Miss E. (927), Rothamsted Experimental Station, Harpenden, Herts. (gen. ent.)
- Renfrew, C. (1507), Lanhill, Bourton-on-the-Water, Glos. (L., gen. ent.)
- Reynolds, W. E. (1350*), 8 Clifton Rd., Squires Lane, London N.3. (L.)
- Richardson, Austin (483), Beaudesert Park, Minchinhampton, Glos. (L.)
- Richardson, N. A. (431), 73 Station Rd., Woburn Sands, Bucks. (L.)
- Rickard, R. M. (1341), High St., Coningsby, Lincs. (L.)
- Riley, D. A. (1477*), 25 Lombard Ave., West Southbourne, Bournemouth, Hants. (L.)
- Riley, N. D., F.R.E.S. (885), 7 McKay Rd., London S.W. 20. (L., gen. ent.)
- Risbridger, M. D. (813*), Woodcock Lane, Birmingham 31. (L.)
- Ritson, W. (1112), 12 West St., Winwick Rd., Warrington, Lancs. (ornith., gen. ent. esp. C., orthoptera)
- Rivers, C. F. (1443), 250 Shepherds Lane, Dartford, Kent. (L.)
- Rivolta, J. R. A. (743), 1 Boundary Lane, St Leonard's, nr. Ringwood, Hants. (L.)
- Roberts, S. F. (216), 29 Holliers Hill, Bexhill-on-Sea, Sussex. (L.)

- Roberts, W. N. (77), 48 Bishops Mansions, Bishops Park Rd., London S.W.6. (L., gen. ent.)
- Robertson, A. W. (323), Ranworth, St Lawrence Drive, Eastcote, Mddx. (E.)
- Robertson, J. A. (224), The Gardens, Rotherby, Melton Mowbray, Leics. (L.)
- Robinson, C. A. (1085*), 155 Regent St., Kettering, Northants. (L., C., O.)
- Robinson, H. S. (1518), Lower Far- rington, Alton, Hants. (L.)
- Robson, J. P. (44), 10 Vane Rd., Barnard Castle, Co. Durham. (L., ML.)
- Rogerson, S. (1398*), 10 Shelley Ave., Sutton Trust Estate, Hull. (L.)
- Ross-Lewin, Major F. H. W. (154), The White House, St Olaves, Gt. Yarmouth, Norfolk. (L., O.)
- Ross-Lewin, R. C. (1474*), The White House, St Olaves, Gt. Yarmouth, Norfolk. (L.)
- Rossner, S./L. A. (1611), 14 Anglesey Gdns., Carshalton Beeches, Surrey. (L.)
- Roudier, A. J. (1294), 6 Square Georges Lesage, Paris 12e, France. (C., L.)
- Rouse, G. D. (1211), Laurel Cottage, Lyndhurst, Hants. (C., gen. ent.)
- Routledge, J. R. (1572), 217 Elles- mere Rd., Benwell Grove, New- castle-on-Tyne 4. (L., O., H.)
- Row, Capt. A. W. H. (1316), 3 Down Rd., Rodwell, Weymouth, Dorset. (L., C., H.)
- Rowden, A. O. (405), Rydon Crest, Countess Wear, Exeter, Devon. (gen. ent.)
- Roxburgh, P. A. (1452*), 505 Caer- leon Rd., Newport, Mon. (L., C.)
- Rudland, W. L., F.R.E.S. (249), 97 Addison Rd., Reading, Berks. (L., ML., H.)
- Russell, S. G. Castle (119), 5 Bridge Rd., Cranleigh, Surrey. (R. vars.)
- Russell, W. (412), 69 Lochlea Rd., Glasgow S.3. (L. camouflage)
- Russell, W. E. (1525), 741 Lincoln Rd., Peterborough, Northants. (L.)
- Salmon, G. R. (1521), 3 Walkers Croft, Wallasey, Cheshire. (gen. ent.)
- Salmon, M. A. (1577*), 5 Greenaway Gdns., London N.W.1. (gen. ent.)
- Sangster, D. R. (578), 69 Leadside Rd., Aberdeen. (L.)
- Sargent, H. B. (1189), Rose Cot- tage, Breage, Helston, Cornwall. (breeding L. and county flora)
- Saunders, J. M. K. (618), 27 Canon- bury Ave., Pinner, Mddx. (R. vars.)
- Saunders, S. D. (1250*), 27 Canon- bury Ave., Pinner, Mddx. (gen. ent.)
- Scott, D. G. (534), Byrlton House, Vallis Way, Frome, Som. (L.)
- Scott, P. (1163*), 28 Craggside Cres., Hawksworth Estate, Leeds 5.
- Scott, W. (1403), 6 Crocketts Ave., Crocketts Rd., Birmingham 21. (R.)
- Seabrook, W. P. (263), St Barnabas, Frinton-on-Sea, Essex. (L.)
- Seago, J. H. (1466*), 63 Hudders- field Rd., Barnsley, Yorks. (L.)
- Sexton, E. T. (1367), 48 Ravenscourt Gdns., London W.6. (gen. ent.)
- Shapland, J. D. (548), Esso House, Abingdon, Berks. (L., mic.)
- Shaw, H. K. Airy, B.A., F.L.S., F.R.E.S. (545), Royal Botanic Gardens, Kew, Surrey. (Hem.- Het., C., E., botany)
- Shaw, J. P. (1204), 49 The Avenue, Beckenham, Kent. (L.)
- Shaw, M. W. (911), Ministry of Agri- culture and Fisheries, Entomology Dept., Woodthorne, Wergs Rd., Tettenhall, Staffs. (gen. agric. ent. esp. fruit pests)
- Shaw, R. G. (1486*), 5 Burnham Rd., London E.4. (L.)
- Sheppard, P. M. (291), Westall, Marl- borough, Wilts. (L., gen. ent.)
- Shield, D. H. (1156), The Hall, Bad- well Ash, Bury St Edmunds, Suf- folk. (L.)
- Showler, A. J. (1442*), 19 Harvel Cres., London, S.E.2. (L.)
- Siggs, L. W. (243), 10 Repton Rd., Orpington, Kent. (L.)
- Simons, C. (1534*), The Stores, Tinge- wick, Buckingham. (L.)
- Simons, R. H. (811), 28 Aylmer Rd., London N.2. (habits, morpho- logy, B., econ., ent.)
- Skelton, Rev. K. J. F. (858), 15 Vicars Close, Wells, Som. (L.)
- Slack, Rev. J. (1629), 48 Station Rd., Petersfield, Hants. (C.)
- Small, H. M. (1349), Stones Cottages, Skellingthorpe, Lincs. (L., O.)
- Smith, D. J. (1324), 16 Royleysden Cres., Chester Rd. North, Sutton Coldfield, nr. Birmingham. (L., C., D.)
- Smith, E. K. (178), 38 Weyhill Rd., Andover, Hants. (L., veterinary ent.)

- Smith, E. W. (1207), 93 Craithie Rd., Town Moor, Doncaster, Yorks. (L.)
- Smith, F. Stanley (389), Hatch House, Pilgrims Hatch, Brentwood, Essex. (L.)
- Smith, G. A. (942*), 1 Acton Rd., Bramford, Suffolk. (L.)
- Smith, G. C. (1406), Furzehill, Fordingbridge, Hants.
- Smith, K. G., F.R.E.S. (897), 38 Barrow St., Much Wenlock, Shropshire. (D., L., gen. ent., NH., B.)
- Smith, K. J. (1289*), 21 The Mount, Cheylesmore, Coventry, Warwickshire. (L.)
- Smith, P. Siviter (250), 21 Melville Hall, Holly Rd., Birmingham 16. (L., P.)
- Smith, S. Gordon, F.L.S., F.R.E.S. (478), Estyn, Boughton, Chester. (L.)
- Smith, T. H. W. (1462), 13 Oxford St., Rugby, Warwickshire. (L.)
- Snell, B. B. (419), Woodsome, Plym-
yard Ave., Bromborough, Cheshire. (L., ML.)
- South, A. (1586*), Ikaya, Frindsbury Hill, Strood, Rochester, Kent. (R., aq.)
- Southwick, Miss M. D. (792), c/o Zoological Society, Regents Park, London N.W.8. (L.)
- Southwood, T. R. E., F.R.E.S. (1051*), Parrock Manor, Old Road East, Gravesend, Kent. (Het., C., E.)
- Spearman, R. I. C. (921), Oaks Bungalows, Oaks Ave., London S.E. 19. (B., NH., social insects)
- Spencer, B. T. (1129*), 63 The Martyres Close, Cheylesmore, Coventry. (L.)
- Spencer, K. A. (1563), 28 Park Drive, London N.W.11. (European L.)
- Sperry, J. L. (1434), 3260 Redwood Drive, Riverside, California, U.S.A. (L.)
- Spink, G. F. (1386), 237 Leigham Court Rd., London S.W.16. (C.)
- Spittles, C. E. (1483), Schoolhouse, Drayton Beauchamp, nr. Aylesbury, Bucks. (L.)
- Stallwood, B. R. (1547), 19 Southfield Gdns., Strawberry Hill, Twickenham, Mddx. (L., O.)
- Stead, P. J. (1296), 43 Roseberry Rd., Middlesbrough, Yorks. (L.)
- Steel, J. A. (1333*), 127 King George's Rd., Ware, Herts. (L.)
- Stephens, J. C. (507), The Quarry, Northleigh, Witney, Oxon. (L.)
- Stidston, Engr. Capt. S. T., R.N., J.P., F.R.E.S., M.S.B.E. (40), Ashe, Ashburton, Newton Abbot, Devon. (L.)
- Stocker, P. P. (933), Waldorf Hotel, Aldwych, London W.C.2. (L., Brit. and continental Ent. lit.)
- Stokes, Capt. G. E. (319), The Brambles, Roe Green, Hatfield, Herts. (L.)
- Stokes, H. G. (828), 12 Roman Rd., Salisbury, Wilts. (Hem., C.)
- Storey, W. H. (277), Fairstead, Long Road, Cambridge. (L.)
- Sturdy, D. A., B.Sc. (988), 10 Stratton Terrace, Truro, Cornwall. (D., O., agric. ent.)
- Suffield, N. L. (1157), 8 Park Place West, Sunderland, Co. Durham. (gen. ent.)
- Sunderland, S. (727), Cragg Mount, Midgehole Rd., Hebden Bridge, Yorks. (C.)
- Sutton, F. G. (403), 58 Blakemere Rd., Welwyn Garden City, Herts. (gen. B., ornith., gen. ent., silkworms)
- Sutton, F. R. (538), 42 Fairfield Drive, London S.W.18. (L.)
- Swain, A. M. (1409), 253 Crescent Drive, Petts Wood, Kent. (L.)
- Swain, F. A. (1418), 48 Malvern Rd., Orpington, Kent. (L.)
- Swann, E. L. (882), 282 Wootton Rd., King's Lynn, Norfolk. (botany, C.)
- Swanson, S., M.A. (1034), Keiss Village, Wick., Caithness. (L. gen. ent.)
- Syms, E. E., F.R.E.S. (406), 22 Woodland Avenue, London E.11. (P. all orders, breeding)
- Tailby, S. R., B.Sc., A.R.I.C. (636), 33 Alexandra Drive, Surbiton, Surrey. (L.)
- Talbot de Malahide, Lord (384), 50 York Terrace, London N.W.1. (L.)
- Taylor, A. G. (433), Whiteshoots Hill, Bourton-on-the-Water, Cheltenham, Glos. (gen. ent.)
- Taylor, A. S. (1510), 2 Lumber, Castle Street, E. Looe, Cornwall. (C., L.)
- Taylor, L. R. (441), 325 Abbey Hey Lane, Manchester 18. (L.)
- Taylor, M. J. (1209*), 51 Grange Rd., Kenton, Harrow, Mddx. (L.)
- Taylor, P. G., F.R.E.S. (719), 51 Woodland Drive, Watford, Herts. (L., agric. pests, B., E., M., phototropy, population studies)
- Taylor, R. C. (1528), Bower Cottage, Station Rd., Withyham, Sussex. (L.)
- Tennent, Dr J. N. (1396), 4 Clairmont Gdns., Glasgow C.3. (H.)
- Thornley, R. (1598*), 4 Lignum Terrace, Askern, nr. Doncaster, Yorks. (C.)

- Thornton, J. N. (1413), 123 Otley Old Rd., Leeds 6. (L., H.)
- Thorp, R. W. T., B.A. (1259), Rose Lea, Alnmouth, Northumberland. (mic.)
- Thorpe, H. J. (482), St Michael's Lodge, Eldorado Rd., Cheltenham, Glos. (L., C., ornith.)
- Todd, A. (1197), Wesley Villa, Thornley, Durham. (gen. ent.)
- Todd, R. G. (1455), Burnt St., Wells-next-the-Sea, Norfolk. (L.)
- Tonge, A. E. (274), Ashville, Trafford Rd., Alderley Edge, Cheshire. (L.)
- Tonge, R. J. (1615*), 123 Rickmansworth Rd., Watford, Herts. (L., botany, NH.)
- Tozer, D. (36), 98 Copdale Rd., Leicester. (L., C.)
- Tremewan, W. G. (940), Wheal Rose, Scorrier, Redruth, Cornwall. (L.)
- Tribbeck, R. A. (1322), Weston, Titchfield Rd., Stubbington, nr. Fareham, Hants. (gen. ent. esp. C., E.)
- Trought, T., M.A., F.R.E.S. (1373), Brookland, Tysoe, Warwickshire. (L.)
- Trought, T. E. T. (1480), St John's College, Cambridge. (L., C., D.)
- Trundell, E. E. J. (690), 6 Arragon Gdns., West Wickham, Kent. (ent. esp. L.)
- Tully, H. (1038), Wellfield, Alnmouth, Northumberland. (C., O.)
- Turner, H. B. (341), Malverleys, Newbury, Berks. (L.)
- Turner, J. W. (1401), 18 Fox Covert Rd., Werrington, Peterborough, Northants. (L.)
- Turner, S. J. (1014), 2 St Leonards Place, Exeter, Devon. (mic., arachnida)
- Twyford, H. S. (1205), 52 Purley Oaks Rd., Sanderstead, Surrey. (gen. ent.)
- Upton, M. Scott (1023), c/o Post Office, North Tamborine, Queensland, Australia. (L., O.)
- Ure, M. (1354*), Woodlands, Seymour Court Rd., Marlow, Bucks. (L.)
- Vardy, C. R. (1414*), San Martino, Rushington Lane, Totton, Hants. (gen. ent.)
- Vaughan-Roberts, R. E. (1410), Llys Athro, Llanarmon-yn-Iâl, Mold, Flintshire. (L., H., gen. ent.)
- Vieujant, R. (898), 44 Avenue Georges Pêtre, Brussels, Belgium. (C., H., L.)
- Vigay, J. F. (1554*), 28 Tooting Bec Gdns., London S.W.16. (L.)
- Vince, A. A. P. (588), 14 Church Hill, London N.21. (L., aq. C., glass-house pests)
- Waddington, L. G. F. (169), 9 Rose Hill Rise, Bessacarr, Doncaster, Yorks. (L.)
- Wade, D. (1104), 17 Waldegrave Ave., Holderness Rd., Hull, Yorks. (L. breeding, ornith.)
- Wager, J. R. (181), 10 Henshaw Rd., Birmingham 10. (L. esp. R.)
- Wakelin, M. F. (1458*), 39 Dodding-ton Rd., Wellingborough, Northants. (L.)
- Wakely, Sir Leonard D. (561), 37 Marryat Rd., London S.W.19. (L.)
- Walder, W. (102), 79 Livingstone Rd., Hove 3, Sussex. (L.)
- Walker, Dr J. A. (843), Highfield House, Hillfield, Cheddar, Som. (L., ML.)
- Walker, M. N. A. (880), 329 Uxbridge Rd., London W.3. (L.)
- Walker, P. J. (856*), 25 Regal Way, Preston Hill, Harrow, Mddx. (gen. ent.)
- Wall, G. (554) Hafod, Merstham, Surrey. (L., C., ornith.)
- Wallace, H. R. (318), 115 Abercrombie Rd., Fleetwood, Lancs. (L.)
- Walsh, G. B., B.Sc. (24), 22 Stepney Drive, Scarborough, Yorks. (C., B., Hem.)
- Walter, P. W. R. (1493*), 190 Carr-house Rd., Hyde Park, Doncaster, Yorks. (L.)
- Walton, A. M. (426), 275 Croxted Rd., London S.E.21. (L.)
- Walton, Miss M. S. (1555), Home Farm, Lower Tysoe, Warwickshire. (L.)
- Wanstall, P. J. (465), 54 Matlock Rd., Brighton 5, Sussex. (R., mosquitoes)
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field: Wyers. **York:** Bootham School
 Natural History Club, Fidler.

NORTHERN IRELAND. **Antrim:**
 Willis.

EIRE

DUBLIN. Baynes.
TIPPERARY. Murray.

SCOTLAND

ABERDEEN. **Aberdeen:** Esslemont,
 Jackson, Sangster.

ANGUS. **Dundee:** Hall.

CAITHNESS. **Wick:** Swanson.

DUMFRIES. **Dumfries:** Balfour-
 Browne, Cunningham.

FIFE. **St Andrews:** Miss Jackson.

INVERNESS. **Kincraig:** Harwood.

KIRKCUDBRIGHT. **Castle-Doug-**
las: McCartney.

LANARK. **Glasgow:** Miss Craig,
 Dobson, Hill, Lothian, Pennock,
 Russell, Tennent.

MIDLOTHIAN. **Edinburgh:** Beattie,
 Finlay, Macnicol, Miller.

RENFREW. **Greenock:** Angus,
 Ewart, Maclaurin. **Paisley:** McNally,
 Ramsay.

ROXBURGH. **Hawick:** Pow.

STIRLING. **Falkirk:** Hutchieson.

WALES

DENBIGH. **Abergele:** Holden.

FLINT. **Caerwys:** Hunking-Moly-
 neux. **Mold:** Henstock, Vaughan-
 Roberts. **Rhuddlan:** Lewis.

GLAMORGAN. **Bridgend:** Par-
 sons. **Caerphilly:** Bennett. **Cardiff:**
 Llewellyn, Pearce.

MERIONETH. **Blaenau Festiniog:**
 Griffiths.

MONMOUTH. **Newport:** Binning,
 Ecutt, Max, Roxburgh.

MONTGOMERY. **Machynlleth:**
 Pelham-Clinton.

PEMBROKE. **Haverfordwest:** Con-
 der.

AES ADVISORY PANEL

Return Postage—The only require-
 ment of members for the use of the
 Advisory Panel is that they must en-
 close stamps to cover cost of return
 of specimens, or stamped envelope for
 reply. Otherwise, reply cannot be
 guaranteed. It will also be of as-
 sistance if the membership number of
 each enquirer is quoted in all en-
 quiries. Unless otherwise stated,
 advice is only given on the fauna of
 the British Isles. Enquirers must
 remember that Advisers are busy
 people: dead material should be sent
 during the winter months when even-
 ings are less likely to be occupied with
 collecting or mounting their own cap-
 tures. Where large numbers of
 specimens are to be named, the en-
 quirer should preferably have this
 done at a Museum, where paid
 officials are employed to deal with
 such enquiries. A personal visit,
 moreover, will usually solicit more
 information than would be obtained
 by correspondence.

Labelling—Details of locality, food-
 plant, date, time and mode of cap-
 ture and many other details are often
 essential to identification. All speci-
 mens should be labelled with such
 data, preferably placed on a small
 card on the same pin as the insect.
 In all cases details of locality will be
 treated as confidential.

New Advisers—There are still many subjects not yet covered by the Panel, and volunteers to assist in these departments are much desired. Offers should be sent to S. M. Hanson, 167 Gunnersbury Park, London, W.5.

Lepidoptera (Butterflies and moths)

Identification of Macro larvae—H. E. HAMMOND, 16 Elton Grove, Birmingham, 27.

Varieties of Rhopalocera — S. G. CASTLE RUSSELL, Stokesay, Bridge Rd., Cranleigh, Surrey.

Rearing Silkmooths—FRANCIS G. SUTTON, 58 Blackmere Rd., Welwyn Garden City, Herts.

Ecology and genitalia, Macros and Micros — DR BRYAN P. BEIRNE, Dept. of Zoology, Trinity College, Dublin, Eire.

Distribution and local lists, Macros and Micros—DR A. A. LISNEY, Dune Gate, Clarence Rd., Dorchester, Dorset.

Identification of Indian macros except Lycaenidae and Hesperidae —R. E. R. PARSONS, Woodlands Lodge, Woodlands Close, Otter-shaw, Surrey.

Coleoptera (Beetles)

Books and collecting methods—G. B. WALSH, 22 Stepney Drive, Scarborough, Yorks.

Identification, other than of the groups named below—D. TOZER, 98 Copdale Rd., Leicester.

Elateridae, identification and general advice—B. A. COOPER, 27 Spilsby Rd., Boston, Lincs.

Halilidae and Pselaphidae, identification and general advice—REV. E. J. PEARCE, St Teilo's Priory, Church Ter., Roath, Cardiff.

Waterbeetles, identification and general advice—PROF. F. BALFOUR BROWNE, Brocklehurst, Collin, Dumfries.

Identification of Cicindelidae, World species (less Nearctic)—Capt. D. B. BAKER, c/o 21 Quarry Park Rd., Cheam, Sutton, Surrey.

Hymenoptera

Identification of Apoidea, Anthophorinae, Coelioxinae and Nomadinae, Old World only—Capt. D. B. BAKER, c/o 21 Quarry Park Rd., Cheam, Sutton, Surrey.

Parasitica, identification and general advice—G. J. KERRICH, Heath Crest, Westcott, Dorking, Surrey.

Diptera (Flies)

Identification and general advice—L. PARMENTER, 94 Fairlands Ave., Thornton Heath, Surrey.

Mosquitoes, identification and general advice—E. W. CLASSEY, 5 Carlton Avenue, Feltham, Mddx.

Odonata (Dragonflies)

Identification and general advice, British and foreign—JOHN COWLEY, Holywell House, Edington, Bridgewater, Som.

Orthoptera and Dermaptera (Grasshoppers, crickets, roaches, and earwigs)

Identification and general advice, British and foreign—W. D. HINCKS, 19 Whitefield, Heaton Norris, Stockport, Cheshire.

Plecoptera (Stoneflies)

Identification and general advice—E. E. SYMS, 22 Woodlands Ave., London, E.11.

Hemiptera-Heteroptera (Het-bugs)

General advice and approximate identification—H. K. AIRY SHAW, Royal Botanic Gardens, Kew, Surrey.

Myriapoda (Centipedes and millipedes)

General advice — D. G. BROWN, Sandown Cottage, Monkton Combe, Bath, Som.

Arachnida (Spiders)

Identification and general advice—DR A. A. D. LA TOUCHE, 21 Alwoodley Gardens, Moortown, Leeds.

Books

General advice—E. E. SYMS, 22 Woodlands Ave., London E.11.

Advice for members on literature dealing with Lepidoptera—P. P. STOCKER, Waldorf Hotel, London W.C.2.

Microscopy

General advice—M. J. HIRONS, 138 Kelvin Ave., Wyken, Coventry, Warwickshire.

Photography

General advice, not colour photography or cinematography — E. G. NEAL, 2 Bishop's Mead, Kingston Rd., Taunton, Som.

Cinematography — D. P. GOLDING, 517 Footscray Rd., London S.E.9.

Botany

Identification of foodplants—H. K. AIRY SHAW, Royal Botanic Gardens, Kew, Surrey.

Selection, propagation and cultivation of foodplants and floral attractions—R. C. DYSON, 112 Hollingbury Park Avenue, Brighton 6, Sussex.

Pests

Farm and garden pests—B. A. COOPER, 27 Spilsbury Rd., Boston, Lincs.

Stored products pests—DR J. A. FREEMAN, 5 Woodmere Way, Beckenham, Kent.

Beekeeping

General advice—J. E. BERRY, School House, Grange-over-Sands, Lincs., and D. M. JESPER, 23 Woodlands Grove, Harrogate, Yorks.

Chemical Matters

General advice—DR H. HENSTOCK, Glengariff, Caerwys, Mold, N. Wales.

Insect Migration

General advice — CAPT. T. DANN-REUTHER, Windycroft, Hastings, Sussex.

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No. 97

BULLETIN

JANUARY 1949

J. W. TUTT

J. W. Tutt (*floruit* 1895) is an entomologist whom I should like to know more about. This short note, therefore, is simply a bait to catch another one. It is obvious that he must have been a very remarkable man. His industry was terrific. He was for many years the editor of *The Entomologist's Record and Journal of Variation*, besides writing for many other periodicals. He compiled, presumably from notes sent by his contributors, the curious and rather indigestible hotchpotch called *Practical Hints for the Field Lepidopterist* (Elliot-Stock, 1901-5) which runs to three volumes and about 200,000 words. This is still in demand and hard to get. He also wrote a lengthy *Natural History of the British Lepidoptera* which perhaps hardly lives up to the claims made in the contemporary advertisements. He was, also, the author of a large number of pamphlets (mostly rare) among them:—

Notes on hybrids of Tephrosia bistortata and T. crepuscularia.

The Drinking Habits of Butterflies and Moths. (An enchanting title!)

The Lasiocampids.

The Nature of Metamorphosis.

The Migration and Dispersal of Insects.

Melanism and Melanachroism.

But I suppose his chief work was *The British Noctuae and their Varieties* (4 vols. Swan Sonnenschein, 1892), a piece of extraordinary erudition, in which he examines afresh every British species, quotes and criticises the original description, and discusses the sub-species, races and varieties not only in the light of his own immense knowledge but with reference to the works of continental authors, especially of Guenée (the author of *Noctuelles*). He must have been a great collector—what happened to his collections, by the way?—but he was much more than an amasser of insects or a pothunter of *mihis*, although he *did* name so many hundreds of varieties! His prefaces show him to be a considerable biologist

in the Darwin and Huxley tradition; in particular, his preface on pigmentation and his essay on melanism display an extraordinarily sound judgment, and (it seems to me) a broad and balanced view on evolutionary matters which was considerably ahead of his time.

I should like to hear more about Tutt from somebody who is qualified to judge him as a biologist. I should also like to hear of a project to reprint some of his writings, especially his introductions and essays.

JOHN MOORE (146).

EDITOR'S NOTES

The Editor would be glad to receive "separates" of papers of a not too technical nature, published by members in scientific journals, which would be suitable for abstracting for the *Bulletin*.

Subscriptions for 1949 are now due.

Contributions for the *Bulletin*, dealing with non-lepidopterous insects, as well as Lepidoptera, are required NOW please.

Good Luck and Good Hunting in 1949.

NOTES AND OBSERVATIONS

A. Bliss (287), writing from near Axminster, says: "In this part of S.E. Devon, the Clouded Yellow (*C. croceus*) has been reasonably plentiful all summer, and was still flying freely on October 24th, some in fresh condition. I have captured three var. *helice* and seen five in all. Vanessids have been unusually scarce, a few Small Tortoiseshells and Red Admirals, and an odd Painted Lady or two. The Peacock (*N. io*) is practically absent, though I had a brood of larvae in the garden." (Cf. D. A. Ashwell's article in *Bull.* 96). He found four full-fed Comma (*P. c-album*) larvae in late September which emerged about Oct. 8th, and comments that all the "Whites" have been very scarce.

J. H. Platts (515) reports that he saw a female Pine Hawk Moth (*H. pinastri*) sitting on a telegraph pole, near Haslemere. He carried it

back to camp on his finger! He tried to kill it with smelling salts, but this only stimulated the moth to lay 16 eggs. She soon recovered from the smelling salts, which were very weak, and was released. The eggs were pale-green on laying and after about ten days turned yellow, with a brown spot and a black streak. These were the young larva's head and horn respectively. The young larvae were yellow with a dark brown head, with two yellow stripes and a black horn which was finely divided at the tip to form a minute Y. After eating their eggshells, they settled down on pine needles. At first they ate the needles from the tip, devouring one side only, but later they ate the whole needle, curving their heads right over the tip, so that their jaws were parallel to the needle. They grew rapidly and soon became green with longitudinal yellow stripes and retained the black forked horn. The final colouring, when the larvae were about 2" long was brown mottled with yellow. The horn remained black and was just visibly forked. At full growth, the larvae were about 3" long.

Miss Barbara Hopkins (827) would like to know if any member of the AES has information on the winter diapause of the Angleshades Moth (*Phlogophora meticulosa*) and of the Silver Y Moth (*Plusia gamma*). She understands that some authorities claim that *P. gamma* does not overwinter in England, but only migrates here in the warmer months.

ASSEMBLING IN CITIES

Mrs Le Fleming Forbes has less cause for surprise in assembling *S. ocellata* in S.W. London (*Bull. No. 95*) than Mr Ison his *S. pavonia* (*Bull. 92*). In most years there are a number of larvae of the Poplar, Lime and Eyed Hawk Moths feeding on sallow, lime and poplar trees in London squares and the larger gardens of crescents and terraces. Sometimes they obtrude on the naturalist's eye; more often a search is required to discover them.

Certainly the fourth storey window is a little high, but it is known that these hawks on emerging from the ground often climb straight up a poplar trunk to the height of thirty feet or so, before expanding their wings. So it was just a piece of moderate good luck that her brother slept so lightly.

W. J. B. CROTCH (1181).

THE THIRSTY GRAYLINGS

I have observed the Grayling (*Satyrus semele*) on the sandy heaths of Surrey and Hampshire, the chalk downs of south-east Cambridgeshire, the Breck sands of Suffolk and the heaths of Norfolk, where it flies over the sparse vegetation of these areas and settles on the barren patches of ground. Most textbooks state that it rarely or never visits flowers.

On August 16th 1947, a cloudless day and one of the hottest that year, I spent an hour or so in the middle of the day at my favourite spot on Lakenheath Warren near Mildenhall. A large number of the Nutmeg Moth (*Hadena trifolii*) were flying at the flowers of the local catchfly (*Silene otites*) and in about half an hour I "walked up" between a dozen and twenty Graylings on this rather barren spot.



"... the Graylings were as thirsty as I was."

Then a wandering Clouded Yellow led me across the road to a small field of lucerne in full bloom, and I have never before seen so many Graylings as there were feeding on the lucerne. Almost every lucerne plant had one on it and I estimated that there were about ten times as many Graylings per acre on the lucerne as there were on the rough grassland nearby. In fact, the Graylings seemed to outnumber all the other species of butterfly put together.

It would appear that on this very hot day the Graylings were as thirsty as I was.

D. A. ASHWELL (223).

8/8/48.

BALSA WOOD FOR SETTING BOARDS

I have found the following to be a simple, quick and inexpensive way of making setting boards.

Buy strips of "balsa wood" from a shop which supplies material for model aeroplanes. Choose the lightest coloured variety. That with a brownish grain showing is usually harder.

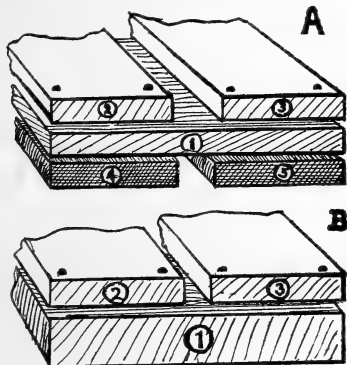


Fig. 1.

Strip 1 (Fig. 1 A) is about $\frac{1}{4}$ " thick and the full width of the board required. Strips 2, 3, 4 and 5 will need to be a little less than half as wide and can be pinned with ordinary "Lill" pins to strip 1, leaving the grooves to any desired width. The wood can readily be cut with a razor blade wherever required. A very smooth surface is obtained with fine sandpaper. Making double-sided boards saves having a thick strip 1, but, of course, a single-sided board can be made if preferred, with a single thicker strip (Fig. 1 B) to ensure rigidity. Also a "Lill" pin is just over half an inch long and the point just comes through two $\frac{1}{4}$ " boards. As the top pieces are only pinned on, the groove can be adjusted in a few moments as required. If altered to make it wider, a little overlap of strips 2 and 3 is of no consequence. Any entomological pin can be pushed completely through the wood with ease. The wood is plentiful.

C. RENFREW (1507).

AN UNUSUAL COLLECTION PEST

While looking through a cabinet of Lepidoptera a few months ago I dis-

covered several adults of the flour beetle (*Tribolium castaneum*) feeding on some of the larger specimens. I do not know if this has been recorded before and feel it is worth noting. I should, however, like to point out that there is a large surplus population of these beetles wandering round the room where the cabinet is kept, as they are being bred in very large quantity and there are invariably numbers of "escapees."

B. O. C. GARDINER (225).

REARING THE COMMA BUTTERFLY

Wanting a series of the Comma (*P. c-album*), I thought I would first try rearing from var. *hutchinsoni*. A wooden frame 3' long, 2' wide and 1' 6" high was covered with $\frac{1}{8}$ " mesh black netting. This could stand over pots or boxes of the food plant on a rough table outdoors and so be movable. A small slit was made in the mesh to introduce specimens and held together with safety pins. Odd var. *hutchinsoni* were taken and put in. The food plant was sprayed with water frequently and slices of apple put on top of the cage (they liked this).

At 5 p.m., July 13th, 1945, a pair was seen *in cop*. The female was put on a single potted plant and sleeved, the rest were released. A total of 118 eggs were laid by July 24th, when the female was released. As the larvae hatched and grew, they were left as long as possible on the original sleeved plant. When nearly full-grown they were transferred to a cage, and pupated hanging from the top. A small green fly was a nuisance, stinging the pupae, so the cage was brought indoors into a cool room. The first imago emerged on Sept. 10th. No *hutchinsoni* emerged and surplus imagines were released in the woods.

The following spring, in these same woods, I saw a number of Commas flying and caught one female on April 7th (1946). Sleeved on nettle, this female laid 112 eggs between April 10th and 25th. The larvae were treated in the same way as the previous summer and 80 pupated. The first imago emerged on July 2nd and was a female *hutchinsoni*. After that they came out in ones and twos. About 22 were var. *hutchinsoni*. All the surplus butterflies were taken back to the woods and released. No

albino and no melanic type was obtained—but the thrill of rearing and the series in my cabinet gives the answer to—is it worth while rearing?

J. H. PAYNE (353).
Wellington.

SEASONAL VARIATION

Observations by myself and other collectors at Newport (Mon.) support E. Owston's (1334) note in *Bull. No. 94* relating to unusual variation in Burnets, this year.

I cannot answer for Burnets, but we have noted at Newport that:—

(1) The colours and markings of many of the species are very intense and clear. I have taken some real museum specimens of Puss Moth, Buff Tip, Elephant and Lime Hawks, the Dot, Purple Thorn, Vapourer and others, all beautifully and clearly marked.

(2) There seems to be a lot of fine large specimens about. I have taken a Puss Moth 3" across, Buff Tips 2½" and some Drinkers 2½" across. The Vapourer and Dot moths are larger than usual.

(3) A number of melanic forms have been present. I have four melanic Marbled Minors, three "doubledayaria" (*B. betularia* var. *carbonaria*) and intermediate forms, a black Brindled Beauty (*Lycia hirtaria*), a dark Engrailed (*Ectropis bistortata*) and a fine dark Common Swift (*H. lupulina*). All the Dots are black with a very prominent white dot this year.

H. G. BINNING (1427).
19/10/48.

ABSTRACT

"The Invertebrate Fauna of Grass-Tussocks: A suggested line for Ecological Study," by the Rev. E. J. Pearce, M.A., F.R.E.S. (796), published in *The Entomologists' Monthly Magazine*, Vol. lxxxiv, p. 169, July 30th, 1948.

Grass-tussocks often support a remarkably large invertebrate fauna, with Insects, Isopods, and Spiders predominant. The richness of this fauna is not generally realised. An actual count gave 345 individuals in one tussock, only 7" in diameter. 14% of these were *Collembola*, 14% *Ichneumonidea*, 17% *Carabidae*, and 25% *Staphylinidae*. A large tussock was estimated to contain at least 1000 insects, mainly *Coleoptera*, *Hymenoptera* and *Hemiptera*. A

smaller tussock in another locality showed *Hymenoptera Parasitica* to be in the majority with *Coleoptera* second. Careful work would be expected to reveal a definite relationship between the type of fauna and the different kinds of tussock.

Work with other amateur entomologists suggests that many collectors have observed and learnt much about this which has never been published. Much "natural history lore"—laboriously harvested over a long time—tends, too often, to be lost to science in this way.

Questions which suggest themselves are:—How many grass-tussock inhabitants are casual visitors (e.g., for the winter months)? How many species and which species are a more or less stable population throughout the year? The answers depend on the type of tussock and its size and situation within a wide field of ecological associations. "Casual inhabitants" begin to invade tussocks in September, and the fauna remains fairly constant till spring, when the number of "casuals" diminishes. During spring and early summer "casuals" are at their lowest, though a period of drought sends them up.

The technique of working grass-tussocks is quite simple. A mild sunny day in late November or early December is a good time. Cut off the tussock just below ground-level with a fine-toothed meat saw, rather than a knife, invert on to a waterproof sheet, shake, count and select into the usual containers (especially "suckers"), the tussock meanwhile standing on another sheet. Repeat until an end is made.

The grass-tussock seems to be an ecological entity particularly amenable to study. Population studies can be made under natural and (in a laboratory) under artificially varied conditions of temperature, humidity etc. Eventually a bearing on economic entomology may emerge when more knowledge is obtained.

(The Rev. E. J. Pearce has a few "separates" of the above paper, and will be happy to send one to any member of the AES—within the limits of the supply—who would care to write for one.—Ed.)

WHERE TO WRITE

Articles, drawings, etc., for the Bulletin to: TREVOR TROUGHT.
Brookland, Tysoe, Warwickshire.

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No. 98

BULLETIN

FEBRUARY 1949

**ANNUAL EXHIBITION AND
ANNUAL GENERAL MEETING
1949**

The above have been fixed to take place at Buckingham Gate Central School, London, S.W.1., on Saturday, March 26th, from 2 p.m. till 6 p.m. Further details will be given in the March Bulletin.

HOW IRRITATING!

J. H. Platts (515) found, in April 1948, a "nest" of Brown Tail larvae (*Euproctis chrysorrhoea*), which he sleeved, and removed the cocoons, after pupation, to a pupa cage. He says: "Naturally, I received a rash on my wrists from the hairs. This was to be expected and the rash soon disappeared. The extraordinary part of the case appears later: during the very hot weather preceding the August Bank Holiday . . . the room, in which the pupae were, became 'infected' with their hairs, so much so that irritation was set up after each visit to the room, regardless of whether the pupae were visited. The heat seems to have accentuated the effects and all members of the family were affected, the worst being large white swellings all over the face and body, down to the waist . . . after these swellings had subsided, minor ones came up after each visit to the infected room. The Brown Tails were, clearly, at the root of the matter."

TETHERING

In my experience, tethering is not a good method of obtaining a mate for a virgin moth, unless it happens that the female tethered is of a species which "assembles" males readily—for example, the Oak Eggar (*Lasiocampa quercus*)—and in such a case it is far simpler to enclose her in a muslin-covered box, collect a few males and put them in a breeding cage together.

However, as a last resort, the female may be tethered and, with luck,

she may be fertilized, though this will occur only under three conditions. First, the female must be undamaged and able to move about freely; second, weather conditions must be such that the males are flying; third, of course, there must be males in the district.

Normally, males and females are on the wing at the same time, and each searches for the other, the male more diligently than the female. The tethered female cannot fly freely and it is here that luck plays an important part, since a male must happen to pass and, also, happen to discover the female.

Very fine silk, such as is used by fishermen for tying flies, I find to be the best tether. This must be tied loosely round the female's body, between the thorax and the abdomen. I use a slip knot which slips with difficulty, so that once round the insect's "waist" the noose can be reduced to the necessary size to fit snugly. Tying the silk without damage to the moth is extremely difficult, and I think it is vital to practise on unimportant moths. It is undoubtedly best to give the moth a whiff of ether first. No ill effect results so long as the insect is removed from the fumes immediately it stops fluttering.

A site must be chosen in the daytime, where the moth is to be tethered. It must be such that under no circumstances will the silk become tangled; the length of silk must be adjusted to suit the site and also allow the moth plenty of freedom.

Lastly, do not tether your moth unless the weather looks suitable; if there are moths coming to light, then you can feel fairly confident that your female is going to be given a fair chance to fulfil her destiny. Remember, too, that it is the early bird that gets the tethered moth—literally.

T. E. T. TROUGHT (1480).

(The above article has been written in response to requests for information on "tethering."—Ed.)

MELANIC MOTHS

Reference Peter Michael's query in *Bull. No. 95*, melanism is more prevalent in the north, but, nevertheless, my observations show that melanic varieties have been more plentiful in 1948 in my district (Bradford, Yorks.). Of 33 Marbled Minors (*P. strigilis*) only 3 were of the usual form, the rest black. Among the innumerable Dark Arches (*A. monoglypha*) was a good percentage of almost black specimens. The Peppered Moths (*B. betularia*) were, as usual, all black, while out of 25 Mottled Beauties (*Alcis repandata*) 12 were a very dark form, 7 partially so, 6 typical. Last February, out of 11 Pale Brindled Beauties (*P. pedaria*) only two were of the grey type, the rest melanic. All these moths were caught at light.

J. BRIGGS (832).

November 3rd, 1948.

BREEDING THE PALE CLOUDED YELLOW

After my remarks in *Bull. No. 94* the following may be of interest, as I believe few *C. hyale* have been reared through the winter.

Having captured a pair *in cop.* on August 19, 1947, I potted out the female on living lucerne and obtained over one hundred eggs. A high proportion of these were infertile, but about forty hatched out, the larvae emerging after eight or nine days of hot weather. The white eggs soon turned orange and changed to purple just before hatching.

The young larvae ate the cuticle of the leaf from both upper and lower epidermis, lying during the day along the mid-rib. They gradually went off their feed during October, and from November to February were quite motionless. The first larva started to eat again on February 13th 1948. The larvae were kept in an unheated room during the winter, and although it was an abnormally mild one the temperature dropped on several occasions below freezing point. Frohawk's contention that they die below 40°F. is certainly not always correct; damp is a much more important factor in my opinion.

They fed up quickly during March and the first pupated on April 4th. They pupated in two positions, some upside down from the lid of the breeding cage, others head upwards among the stems of the food plant.

One of the latter was interesting as the larva had made numerous silk threads about half an inch away from its body, giving the impression of the first stages of a loose cocoon.

The butterflies all hatched out between April 26th and 30th. Incidentally I found that of the sixty specimens examined in Kent during August 1947 two belonged to the "new" species (*C. alfacariensis*).

E. G. NEAL (467).

THE PALE CLOUDED YELLOW

Referring to E. G. Neal's (467) article in *Bull. 94*, p. 218, Captain T. Dannreuther (60) writes, giving further information from incomplete records in hand on October 1st, 1948. With regard to Mr Neal's query whether his taking three *C. hyale* on August 4th, 1948, was an early record, he says, "In 1947 a fresh brood appeared with the Kent immigration on August 3rd, but this year's (1948) records from A. J. Dewick, of Curry Farm, Bradwell-on-Sea, near Southminster, Essex, gives emergence from July 31st. His (Mr Dewick's) records for 1948 are as follows:—May 22nd to July 3rd, 28 *C. hyale* recorded. Some probably bred locally and several observed ovipositing. 100 ova began hatching on June 19th. Ova taken mid-June started emerging on July 31st. (*These were, presumably, bred specimens.*—Ed.)

He refers to a note by D. F. Owen (1330) in the *Entomologist* (81: 169) of two males captured in a field in Kent, one with wings still limp when captured, on May 23rd. Two "freshly emerged" males had been captured in the same field on May 21st. On May 30th a female, with her wings still limp, was also captured there (*Entom.*, 81: 220). The first 1948 *C. hyale* were recorded on May 8th, Breaun Down (Som.); May 9th, Pett (E. Sussex); May 19th, Folkestone, after *C. croceus* on May 16th.

Captain Dannreuther would be glad to have further records for 1948, from members of the AES, of the occurrences of the Pale Clouded Yellow.

A WARNING

The following article has been sent in by G. G. Cavanagh (1004) as a terrible warning to members with journalistic leanings. It appeared in

a local paper (which had better, perhaps, be nameless), written in all seriousness.

THE GOAT MOTH

"Something unforgettable happened on one long damp day. It ended at evening in that maddening way it has sometimes, with a clearing blue sky and slanting beams from a sun setting in a watery grave. Fine, at last, but too late to be of use!

"Flitting on wings so rapidly beating they are impossible to see—an action that is more like that of propellers than of wings—I saw the Humming-bird Goat Moth visiting the last of the lavender flowers. All these years, and this is the first time I have seen this more rare insect! Keeping quite still so as not to frighten it, the creature came quite close to me and I was able to observe its long, curling tongue, its mouse-like face, its bright jewel-like body, as it darted with incredible speed from flower to flower, inserting the tip of its long tongue and feeding on the nectar without settling on the plants.



"White calls the Goat Moth 'a vast insect,' and indeed it is of incredible size, reminding me of a very small tail-less mouse in a coloured petticoat flying between two brown whizzing propellers! A difficult creature to observe, for when not actually hovering over the flowers its movements are faster than sight. When it had exhausted the few lavender flowers still in bloom it sped away at an incredible speed. And, attentive as I tried to be, I could not see which way it went. The creature just vanished. I have walked by the

lavender bushes at the same time for several evenings since, hoping to see the Goat Moth again, but so far without reward."

* * *

Well! Well!

ARE CRYPTIC DEVICES A PROTECTION AGAINST THE INSECT FOES OF CATERpillARS?

I was interested recently in a broadcast talk on the protective colouration, shape, position, etc., taken up by animals, insects, etc., against attack. From my own observations on caterpillars this form of deception is successful against birds but I doubt whether it is against their insect foes. For instance, this summer I shook from an apple tree a caterpillar of the looper type and replaced it on a branch. It eventually took up a position near some small twigs. It was of the same black colour, the same shape, even to the buds, and leaned out backwards at the same angle as the other branches. Had I not watched it I should never have found it again. I visited it later and it was in the same position leaning at the same angle apparently asleep. There were plenty of birds in the garden but none had found it. As I watched, a fly of the family Tachinidae flew up, landed directly on the back of the caterpillar, laid three small eggs and flew off. There was no search or hesitation, the fly did not make the mistake of going to a branch first. I should imagine that the fly is attracted to its prey by smell or some other instinct rather than sight. This fly is similar to a house fly in appearance and does not pierce the skin of the host to deposit its eggs. They are laid on the skin, attached by some sticky substance, and when the grub hatches out it burrows into the body of the unhappy caterpillar.

G. GOODBODY (1470).

SPHINGID CHOIR

The following paragraph, which may interest members, occurred in a letter I received from a distinguished entomologist who lives in Kenya Colony:

"You would enjoy a good evening out here when the Sphingids are about. Sometimes our beds of petunias and salvia are—I do not

exaggerate—a booming cloud of *charis*, *medea*, *celerio*, *convolvuli*, *eson* and *livornica*. The noise they make is almost incredible! The first two and the last one sing alto; *celerio* and *eson* supply tenor; and *convolvuli* a good bass! It is, of course, only now and then that they turn up in such numbers . . .”

There are other considerations to take into account before you emigrate!

W. J. B. CROTCH (1181).

HINTS FOR JUNIOR MEMBERS

If the first box you use as a store-box has no “camphor cell,” cover a matchbox with white paper, pierce some pinholes in the top and glue the box, side downwards, against the side of the store-box, leaving room to open the matchbox, which can then be filled with flake-naphthalene. The store-box can be placed on end when the “cell” is opened or closed, to prevent spilling.

Whatever killing agent is used, if specimens not set immediately are put in a stoppered jar, with a depth of $1\frac{1}{2}$ ” or more of chopped up laurel leaves at the bottom covered with a piece of thin card to keep the leaves in place, and a layer of cotton wool, the insects will keep well relaxed for several days. Young leaves should be chosen, and should be perfectly dry or else mould will form. Laurel is too slow for *killing*.

Setting needles are easily made by pushing the eye of a fine needle into a small “handle” of soft wood, or forming a holder of heated sealing-wax.

Insects should be left on the setting board for at least a fortnight; the larger butterflies and moths for a minimum of three weeks if space will permit.

G. C. HOLROYD (253).

(To be continued.)

BREEDING FOX AND LAPPET MOTHS

Recent accounts in the *Bulletin* of complicated methods of breeding *Macrothyliacia rubi* (Fox Moth) and *Gastropacha quercifolia* (Lappet) prompt me to recount my own experience with these species. I feel that novices reading the aforementioned notes will be needlessly disheartened if they have not the various appliances available.

On 20th June 1935 I found a batch of *rubi* ova laid in “ring” formation round a stem of Rush (*Juncus* sp.) growing amongst heather. These hatched 10 days later, the larvae were fed on heather followed by loganberry and kept in an ordinary breeding cage. I found they were unable to climb the prickly stems of loganberry so the leaves were laid on the floor of the cage and renewed daily. At the beginning of October they had ceased feeding so I put them into winter quarters. This consisted of a wooden box (approx. 18” x 15” x 15” deep) with the bottom drilled for drainage and the lid of perforated zinc, filled with heather cut 6-8” long stood upright; this remained green throughout the winter. This “hybernacle” was put on bare earth in the garden exposed to all available sunshine. In the spring further loganberry leaves were supplied but these were hardly touched and the larvae pupated between 15th and 30th April. From 36 full-fed larvae in October about 30 imagines appeared between 25th May and 8th June. Perhaps the winter of 1935-36 was particularly favourable or perhaps I was just lucky!

In the case of *quercifolia* I have bred these on many occasions with 100% success. The larvae were kept in a breeding cage in an outdoor shed during summer and spring and fed on Sallow and/or Plum. For the winter I sleeved them on a potted Sallow tree where they hibernated clinging to the main stem.

JOHN E. KNIGHT (94).

NOTES AND OBSERVATIONS

R. J. WHEATER (1425) records the capture of three Large Tortoiseshells (*N. polychloros*) in the Brighton district on March 26th, April 13th and July 28th, 1948. Also the capture, near Brighton, of a Marsh Fritillary (*Euphydryas aurinia*) on May 14th, 1948, and a Great Brocade (*Eurois occulta*) near Beckenham, Kent, on July 3rd, 1948.

B. C. A. EARL (1388) writes: “While sorting through a box of very small beads, we came across the dead imprisoned body of an ordinary clothes moth, as well as its empty cocoon. The latter was constructed of dozens of the small beads, actually fastened together with strands of silk and with an inside silk lining which still con-

tained the empty pupa. It is certainly the most unique cocoon I have ever seen, and I have only heard of similar occurrences in the Psyche Moth family."

D. TOZER (36) reports: "A worn and hibernated female of the Large Tortoiseshell butterfly (*N. polychloros*) was taken by myself in a small wood about 5 miles from Leicester, on the 8th May 1948. I think it must have been the first specimen to have been seen in this county for many years." (Cf. pp. 219 and 230, *Bulls.* 94 and 96.)

UNUSUAL CONDUCT OF A COMMA BUTTERFLY

On July 25th, 1948, while collecting insects on the border of a small wood near Leicester, I noticed a specimen of the Comma (*P. e-album*) butterfly attempting to feed on the half-dry carcass of a squirrel lying on the grass in a field. I have generally found this butterfly very wary when approached, but this particular one was so engrossed in its attempts to obtain a meal that it did not try to escape; even on placing a net over it the insect merely continued probing the carcass with its proboscis. *Apatura iris* is evidently not our only butterfly with a depraved taste!

D. TOZER (36).

BEE-HIVE INTRUDERS

I have had the opportunity of making some interesting observations on the life history of the micro *Galleria mellonella* (Honeycomb moth), thanks to a neighbouring bee-keeper. The product of one hive was entirely destroyed by the presence of its larvae. As sections of the comb were removed in September, each cell contained a larva or pupa, and adults were emerging at the same time that larvae were feeding in adjacent cells. Males and females emerged in even numbers, the difference in size and contour of the wings being very striking. The females, without exception, equalled in size the average *Plusia gamma*.

It would appear that this parasite of the bees cannot be counter-parasitised by any other order of insects, as the cells in which the larvae feed are thinly sealed until emergence. Strangely enough, the bees show little sign of aggression, and are rather inclined to forfeit their home in favour of *mellonella*.

A section of comb required for the cabinet may be preserved by complete immersion in methylated spirits for approximately 15 minutes, any living larvae therein will immediately vacate the cells by pushing away the thin layer of film over the cell entrance and sink to the bottom.

Another winter inhabitant of the hives is the full-fed hibernating larva of *P. fuliginosa* (Ruby Tiger); in some instances several were found in one hive. If the larvae are removed during the winter and transferred to an observation cage, in my experience less than 50% pupate in the spring, the remainder dying at pupation time. If the larvae were ichneumonised it is quite improbable that they would live after September. My theory is that a form of virus accounts for the casualties, as is so often the case with *A. caja* larvae about to pupate. It will be interesting to discover if this happens when the larvae are left in their natural surroundings.

PAUL H. HOLLOWAY (429).

SUBSTANCES FOR KILLING INSECTS

I have received frequent questions from members respecting the killing of insects, so I now give some of the best known methods and substances employed.

(1) **Potassium cyanide** (KCN) is a creamy-white crystalline salt, easily soluble in water, hygroscopic (easily absorbs moisture), smells of almonds and is non-inflammable. It is *extremely poisonous* and gives off prussic acid vapour (also extremely poisonous to breathe) on coming in contact with an acid. The solid cyanide is usually mixed with plaster of Paris and the mixture spread evenly, about 1" thick, at the bottom of a killing bottle. Advantages:—With reasonable care it is harmless and is handy to carry about in field work. One filling lasts a long time. Disadvantages:—It rapidly kills insects but soon renders them rigid and difficult to set, especially the *Geometridae* and some *Coleoptera*. Very rarely it affects the colours.

(2) **Strong Ammonia** is a solution of ammonia gas (NH_3) in water, forming ammonium hydroxide (NH_4OH), which smells strongly of ammonia, is non-poisonous and non-inflammable. It is usually used by soaking the cork of a small zinc pocket relaxing box

with it, until the cork remains damp. Advantages:—Insects pinned in this are soon killed and will remain relaxed for days. Colours are rarely affected, except the greens. Disadvantages:—Corks require re-soaking fairly frequently. The box is rather smelly, though harmless to carry about. Use black pins, white ones are corroded.

(3) **Chloroform** (CHCl_3) is a heavy, colourless, pleasant-smelling, mobile liquid, easily giving off vapour, which acts as an anaesthetic if breathed in large quantity, but is harmless enough in small amounts. Boiling point, 61.5°C . (145°F). It is non-inflammable and is not hygroscopic. One or two drops (not more) on the cork of a dry killing bottle will soon stupefy insects and keep them quiet for many hours. On turning them out they will usually recover. If they are required dead, then three or four extra drops are put on the cork and the bottle is allowed to stand for from ten to thirty minutes, depending on the size of the insect. Beetles take longer, but become very rigid. Speaking generally, the larger the insect the bigger the dose and the longer the time. Geometers may require only one extra drop. Advantages:—The method is dry, clean, not smelly; insects can be kept comatose yet limp till set; it does not affect the colours. Disadvantages:—A small dropping bottle containing the chloroform has to be carried in field work.

DR H. HENSTOCK (209).
(To be continued.)

MEMBERSHIP

The rapid growth of the AES has been a natural growth; members have recommended the Society to their friends, and it is known that by far the greater number of members have been so acquired. But there must be many entomologists who work alone, who can only be reached by publicity methods. Young people often have a keen interest in insects, but the frequent impermanence of this interest is often because they know no older collector to help and advise.

It is impossible for a few officers, many of whom live in or near London, to discover prospective members all over the country. So the Publicity Secretary needs country assistants who would see that the AES and its publications did not escape the

notice of any entomologists in their neighbourhood; by personal correspondence to likely persons who reveal their interest in the local press, by writing letters or articles themselves on entomological subjects, by circulars to schools in their district, by the surreptitious insertion of prospectuses in borrowed books, by the display, if permitted, of posters in public libraries and other suitable situations and by any other reputable means their ingenuity may suggest.

An analysis of geographical distribution made by Mr John Cowley, shows that members preponderate in the southern half of England. Helpers are, of course, needed here, but obviously the greatest need is in the northern counties of England, in Scotland, Wales and Ireland.

Therefore, will any member, prepared to help with this work, please write to the *Hon. Publicity Secretary*, 8 Parry Road, London, S.E.25, giving a rough idea of the area they are prepared to cover. Members who travel about the country can also be helpful and even those who can do nothing but have an inspiration of a high order, should pass it on for others to implement.

E. LEWIS (952),
Hon. Publicity Secretary.

NEW ADVISERS

Capt. D. B. Baker (1511) has kindly undertaken to advise members on the determination of the following:—

Coleoptera : — *Cicindelidae*, world species (less Nearctic).

Hymenoptera:—*Apoidea*—*Anthophorinae*, *Coelioxinae* and *Nomadiinae*. Old world only.

He is also prepared to assist in giving general advice to the junior members.

All communications to be addressed: Capt. D. B. Baker, R.A.O.C. (345262), c/o Lloyds Bank, 6 Pall Mall, London, S.W.1.

Mr P. P. Stocker (933), Waldorf Hotel, London, W.C.2, will be pleased to give junior members advice on literature dealing with *Lepidoptera*. This offer is mainly for those who lack museum or library facilities to consult entomological works of reference.

Will all members please note that when making use of the Advisory Panel, they must enclose stamps to cover cost of returning specimens, or stamped envelope for reply.

S. M. HANSON (310),
Hon. Secretary.

REVIEWS

The Behaviour of Bees—and of Bee-keepers by H. J. Wadey, vii + 175. 12 line blocks by Neil Nettleton. $7\frac{1}{2}'' \times 5''$. Published by Bee Craft, Petts Wood, Kent; 1948. 6/-.

Mr Wadey's new book will be enjoyed by experienced beekeepers and beginners alike.

The book is divided into three sections, as follows:—

Twelve chapters designed to make the reader think and experiment. Mr Wadey is too experienced to be dogmatic and asks many questions, the answers to which cannot be found in any other work.

Fifteen chapters of amusing anecdotes concerning "would-be" beekeepers whom every apiarist will have met on the road to proficiency. A pleasant interlude.

Then, finally, a further seven chapters again destined to make the reader think. He makes many interesting points concerning subjugation, ventilation, virgin queens and other variable factors in connection with honey production which have been given much thoughtful consideration.

The book is refreshingly written with just that amount of wit which assures enjoyable as well as instructive reading. He avoids the repetition of assumed and stated facts and the textbook technique found in so many other works on Beekeeping, and he is up to date with the latest knowledge of research on his subject. The drawings are amusing and to the point.

It is well worth the published price of 6/-.

D. M. JESPER (1152).

Butterfly Haunts by L. H. Newman, F.R.E.S., F.R.H.S., published by Chapman & Hall, London; November 1948. Price 21/-.

This book consists mainly of photographs—on one side of the page the

perfect insect is shown, and opposite, the type of locality generally inhabited. Under each butterfly there is a short descriptive note giving a few salient details of the specimen.

The publication is divided into five distinct sections, butterflies found in the Lane, Woodlands, Mountains and Hill-sides, Water's Edge, and lastly the Migrants. Naturally under such headings the order followed in the book bears no relation to the usual methods of classification. This the author has realised and at the end of the book has given a classified list of British butterflies based on the AES publication.

It is a pity that of the sixty-four insects shown, twelve photographs have already appeared in Vere Temple's *Butterflies and Moths in Britain* (reviewed in *Bulletin* 81). Surely a different photograph of the Large Tortoiseshell could have been obtained, instead of reproducing one already subjected to criticism?

All the insects are magnified but, unfortunately, the extent of magnification has been omitted, a rather serious drawback, as no idea of size can be established. The plates of localities, as photographs, are very good. The majority are taken in the British Isles but a few are shown of the Mediterranean area, in the section dealing with Migrants.

The placing of insects in sections according to the type of country inhabited is difficult, as there are many butterflies to be found in vastly different geographical areas, but the inclusion of the Grayling in the Water's Edge section would appear to be misleading.

This book should appeal to nature lovers and the younger butterfly collectors, although the price is rather high.

S. M. HANSON (320).

Guide de l'Entomologiste by G. Colas. Pp. 310, with 144 figs. Paris: N. Boubée et Cie, 1948. 12/-.

This valuable handbook is written in a clear style, and in easy French, which most people should be able to understand. The recently published *Entomologie Pratique* was but a small part of the work, which is a complete treatise of entomological technique. M. Colas has always been in close touch with amateurs, and he

writes with a full knowledge of what the amateur needs; he writes from a full experience.

The book is divided into five sections, the first of which deals with the entomological armoury of to-day. This is written chiefly for the tyro, but some very ingenious pieces of apparatus are described. One wonders, indeed, whether such ingenuity be not misapplied: some of the apparatus would be of very little use. But the figures are useful, especially to those who like to forge their own weapons.

The next two parts are concerned with catching insects—"La Chasse." The descriptions of instruments and methods are coloured with observations on the habits of so-called "rare" insects—it is M. Colas' view that: "Il n'y a pas en réalité d'insectes rares, en ce sens qu'ils seraient peu nombreux dans la nature." There are only those species we cannot easily find, the localised, the secluded, the shy. Amateurs can do valuable work on such species. Some of the methods shown are, however, rather out-moded: the permanent light-trap cannot compare with our latest models.

The preparation and arrangement of insects in the collection is the theme of parts 4 and 5. All the methods of mounting and of preservation in general use on the Continent are described. Some are practically unknown in England, and could be usefully adopted. Finally, there are notes on rearing and the transport of insects. A useful, clearly-arranged European bibliography concludes the book.

Coleopterists will find the work exceedingly helpful, and M. Colas devotes considerable attention to the less-known orders. It is a book for all entomologists, "du débutant, au collecteur spécialisé." The paper is good, the type clear, the illustrations not only good, but numerous.

M. H. PORT (799).

Obtainable from Anglo-French Literary Services, Ltd., 72 Charlotte Street, London, W.1.

AES PUBLICATIONS

LABEL LIST (3/6) and Check List (1/6) of British Lepidoptera (together 4/3). Label List of British Butterflies (4d). The Hymenopterist's Handbook (7/10). [To non-members, 10/10]. Experiments with Bees (AES Leaflet No. 10, recently published), 7d each; 5/- per dozen.

DATA LABELS—4½ point (diamond) labels are printed in multiples of 125 for one wording. 4-line, 12/6 per 1000 (7/- per 500); 3-line, 10/- per 1000 (5/- per 500); sex signs, 1/- per 200. Other labels can be printed to members' requirements.

These, and other AES Publications, may be obtained from the Publications Sales Manager, C. B. PRATT, 1 West Ham Lane, London, E.15.

WHERE TO WRITE

Articles, drawings, etc., for the Bulletin to: TREVOR TROUGHT, Brookland, Tysoe, Warwickshire.

Articles, drawings, etc., for other AES publications to: B. A. COOPER, 27 Spilsby Road, Boston, Lincs.

Exchange Notices and advertisements to: E. LEWIS, 8 Parry Road, London S.E.25. (To reach him by 15th February, April, June and September.)

Notice of change of address to: J. COWLEY, Holywell House, Edington, Bridgwater, Som.

Subscriptions to: G. B. HODGES, 12 London Road, Braintree, Essex.

Offers to lead field meetings, exhibit, etc., to: D. P. GOLDING, 517 Foots Cray Road, New Eltham, London S.E.9.

Requests for literature for prospective members to: E. LEWIS, 8 Parry Road, London S.E.25.

Applications for new membership to: S. M. HANSON, 167 Gunnersbury Park, London W.5. Also offers of help with AES work, and suggestions for improvements in our organization.

Silkmoth Rearer's Handbook, Data for the revised issue to: W. J. B. CROTCH, 5b Stanley Crescent, London W.11.

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BULLETIN



No. 99

MARCH 1949

THE COMING OF SPRING

With March, and its swelling buds and opening willow catkins, the urge to collect is always strong in my veins; the more, therefore, my feeling of frustration at being stuck in a district so devoid of woods and waste places, of hedges and hills, of stones and moors, of meadows and flowery banks! Oh, to be in England, away from the cultivated bareness of Holland (Lincs.)!

John Moore (*Bull.*, No. 83, p. 102) has spoken of the joys of mothing at willows; if the night is propitious, there surely can be no better sport than this, though if a frost falls it can be more than chilly. Working sloe, damson and plum blossom, a little later, can be equally interesting, and, of the spring emerging species, fertile females, worth keeping for eggs, are perhaps then more frequent. An old and large sheet laid on the ground beneath the trees is the best beating tray, though the more orthodox Bignell pattern or old umbrella is easier to manipulate over bushy ground or alongside a hedge.

Searching, sweeping and beating for caterpillars at night is perhaps a less exciting but a more sustaining form of amusement. I have at this time of the year had more all-night larva-hunts than all-night moth-hunts, though perhaps this is a measure of the larval tolerance of cool night air. But early spring nights can be very long and dark and full of queer noises and thuds, particularly after midnight has struck—in high summer one is too busy most of the time (if it is worth staying out all night!) to get jumpy at the eerie bumps and patterings that seem to become more frequent when one is out alone!

The young growth in felled woods is always profitable. *Amathes ditrapezium* (Triple-spotted Clay), *A. triangulum* (Double Square Spot), *A. baja* (Dotted Clay), *Diarsia brunnea* (Purple Clay) were usually commonest on the young growth of the Rose-hay Willow-Herb, Foxglove, and Primrose in such places. On the ivied trunks in the denser unfelled



The beginner's first night out alone.

areas one of my favourite captures was the larva of the Old Lady Moth (*Mormo maura*). On the young shoots from felled or burnt birch stools *Polia hepatica (tincta)* was common in some years, but seemed to disappear as the birches got taller. *Triphaena fimbriata* (Broad-bordered Yellow Underwing), *T. janthina* (Lesser Broad-bordered Yellow Underwing) and *Polia nebulosa* (Grey Arches) usually occurred, less commonly, on the birches at night, or on hedgerows and on honeysuckle in the less heathy woods. On the heather itself, *Amathes agathina* (Heath Rustic) was common in some areas and *Lycophotia varia* (True-Lover's Knot) in others, but I never discovered why they so rarely seemed to occur together in any abundance. Grass, again, has its own wide range of feeders, from the Meadow Brown (*Maniola jurtina*), Ringlet (*Aphantopus hyperantus*), Wall Brown (*Pararge megera*) and Gatekeeper (*M. tithonus*) to the more local Speckled Wood (*Pararge aegeria*), Small Heath (*Coenonympha pamphilus*), Marbled White (*Melanargia galathea*) and Large Skipper (*Ochlodes*

venata). The majority of captures, however, are the Square Spot Rustic (*Amathes xanthographa*), surely the most common Noctuid, with a sprinkling of more interesting Noctuids and a few Geometrids. Some interesting beetles also are sometimes swept at night.

B. A. COOPER (19).

A USE FOR SPONGE RUBBER

The following note is taken from the *Entomological News*, Vol. 53, pp. 22-3, January 1942:

When shipping insects mounted on pins or on cardboard points attached to pins, it is necessary to fix each pin in the bottom board of the container. Subsequent removal of the firmly imbedded pins is frequently difficult, especially when the specimens are numerous or crowded. Forceps must be attached to the base of the pins and this is often hazardous with crowded specimens. Sponge rubber, of the type used in kneeling pads, if substituted for the usual pinning base, has been found to eliminate these difficulties. Specimens fixed in this material can be removed without the use of forceps or, if forceps are employed, by attaching them to the upper part of the pin. Danger of injury is lessened and speed of transference increased. In all respects sponge rubber seems superior to other pinning media.

The material may also be used for the temporary pinning of insects for study. The ease with which insects may be inserted or removed makes it useful in some cases, for lining insect boxes. It is durable, samples giving satisfactory results after four years' use.

(Curtailed from H. F. Schoof, North Carolina State College, Raleigh, N.C.)

MITES ON BUTTERFLIES

On 15th November 1948 four Small Tortoiseshells (*A. urticae*) emerged in my breeding-cage indoors from pupae (bred from wild larvae). Some days later I noticed that three of them had not moved from where they had hung themselves to dry their wings, and found them to be swarming with small red mites. By the 24th November the three were dead, their bodies being almost shrunk away. How did these mites get in-

doors, or were they in the pupa before the emerging of the butterflies? Would the mites cause the late emergence of the Tortoiseshells? I have never had this happen before, in breeding; but on one occasion, some years ago, I saw a male Meadow Brown (*M. jurtina*) in flight, literally infested with these parasites. In *Bulls*, 88 and 93 I notice several members gave information about seeing these mites, and in *Bull*, 87 Mr Bebe voiced the same query as I have done above. Apparently very little is known about these mites but I would be glad of further information.

ALAN P. MAJOR (1117*).

HINTS FOR JUNIOR MEMBERS

(Continued from page 8)

Remember that it is better to aim at quality, including the condition of specimens, excellence in setting, etc., than quantity. Do not kill insects which are in poor condition.

When rearing larvae always provide sufficient fresh food, and avoid overcrowding. Twigs in a small bottle of water keep fresher, but plug the opening with cotton-wool to prevent larvae drowning, and make sure they are able to get back on to the plant if they fall or crawl off.

For most larvae that bury to pupate, three or four inches of peat-moss is as good as or better than earth. Leave them *in situ* during winter, in a cool place and free from excessive damp. The pupae can be carefully dug up in the spring and placed on the surface. "Damping" is a matter of opinion, but should only be done with restraint.

Make sure that the breeding-cage has sides and top of a suitable surface to enable newly-emerged imagoes to crawl up and hang upside-down to expand their wings. Muslin pasted on to the sides and top of a box will give a suitable foot-hold.

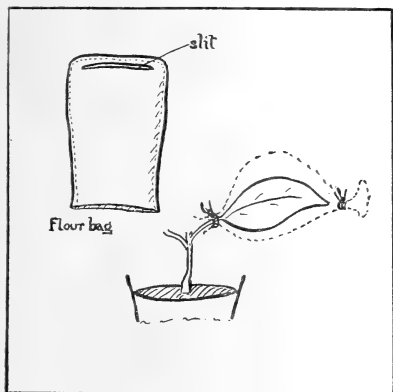
Try to find out as much as possible about the insects you collect, and to derive interest from a knowledge of their habits, life-histories, etc., as well as by merely acquiring specimens. Both you and your collection will then benefit from what you learn.

G. C. HOLROYD (253).

(To be continued)

NOTES AND OBSERVATIONS

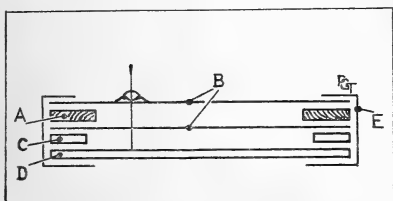
Miss BARBARA HOPKINS (827) notes that "The best method of rearing young larvae is to bag them on their food-plant. Flour bags, out of which all the stiffening has been washed (boiling is best) are ideal. If possible the plant should be potted up.



The bag is slipped over a leaf and tied round the petiole with a piece of string. Do not tie complex knots for obvious reasons. It is an advantage to have the other end of the bag slit, above the tie, to facilitate daily inspection. When the leaf is eaten, cut the stalk, open the lower end of the bag and slip over a fresh leaf. The fresh leaf should be kept horizontal while the bag is being slipped over, thus preventing the larvae from falling out."

PAPER SETTING BOARDS

For a long time it has been impossible to buy minute pins for mounting Homoptera and other small insects and I have been forced to use gum instead. Now, at last, I have been able to obtain a small supply of the necessary pins, but find that they are prone to bend when thrust into cork and, Necessity being the Mother of Invention, I have devised a simple type of setting board which is very suitable for small Coleoptera, Hemiptera, etc.



A narrow rectangular framework (A) of $\frac{1}{8}$ " wood about $\frac{3}{8}$ " wide is made of suitable size, which is held together by glued half-joints. This is covered on both sides with white paper (B), and for this purpose typing paper does very well. It is very important to stretch the paper before gumming it to the faces of the frame. The best way is to lay the paper on a sheet of clean glass and damp it on both sides. The frame is then gummed on one face and pressed on to the damp paper. It is then lifted and placed to dry with the paper side upwards and a piece of glass on top to keep it in position. The first side of a number of boards can be done at the same time, one being placed on top of the last as the work proceeds, with the sheet of glass above all. When dry, the paper will be found to be tightly stretched on the frames. They can then be reversed and the second side covered in the same way.

A narrow strip of cardboard about $\frac{1}{8}$ " thick (C) is glued to the long edges of the underside, and over this a piece of cardboard (D) is glued, which leaves a space below the lower piece of paper and forms the bottom of the board. It is a good plan to put a little powdered naphthalene in this space.

The boards can be finished off neatly with a little passe-partout binding (E). The boards should, of course, be made to fit some form of setting house, and in my case ten or eleven such boards will fit comfortably on runners in a cigar box measuring 9" x 5 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ ".

The insects are pinned on minute pins which pass through the two layers of paper and rest on the cardboard base. Legs, etc., can easily be arranged if sufficiently relaxed without extra pins, but cabinet points can be used for this purpose if necessary.

A. L. CAPENER (6).

THE SILVER Y

Re AES Bulletin No. 97, p. 2, the answer to Miss Barbara Hopkins (827) is that *Plusia gamma* is continuous-brooded in temperatures above 62°F. and cannot tolerate temperatures below 45°F. Occasional specimens in all stages have been recorded in each month, but in winter it is very rare (about 1:20,000) and migratory swarms start to go south in September. In 1948 *P. gamma* was first

recorded at Arundel on 6th April by G. M. Haggett (1200) and last at Plymouth, on 16th December, when the temperature was 50°F., by F. W. Jeffery, Devon recorder.

In America, a similar moth, called *Alabama argillacea* Hb. disappears at 62°F. and in Teneriffe, where this temperature is normal, the Silver Y does not occur, except as the variety *circumflexa* [with an inverted "v" mark instead of a "Y" mark], which has a winter diapause there. See also my article on "The Silver Y Moth" in *School Nature Study*, January 1935.

T. DANNREUTHER (60).

COLLECTING CLEARWINGS

I would remind members that, instead of hibernating like their favourite insects, they can profitably employ mild periods during early Spring in gathering a few specimens of the internal feeding larvae of Clearwing moths.

A study of the methods advocated in the excellent articles by Mr Classey, in earlier Bulletins*, will repay the reader; for the gathering of larvae and pupae *in situ* is the only really satisfactory way of forming a collection of these interesting and elusive insects.

The commonest clearwing in one locality here is the White-Barred Clearwing (*Aegeria sphecoformis*), an insect, until recently, regarded as a rarity. It is more than likely, however, that it is really quite a common species for by searching alders in many spots in the Midlands, I have rarely failed to find its borings.

I well remember how a party of local AES members took train to the nearest locality, in the early months of 1948. Armed with gumboots, knives and saws of various patterns, we represented a formidable appearance albeit clean and tidy on the outward trip. A few hours in the marsh, however, soon altered our appearance and our arrival at the station, although triumphant, did little to recommend entomology to the fastidious, for plenty of mud adhered to our persons and possessions. The acquisition of various large portions of alder trunks, some partly concealed by sacking, some not so well concealed, made entry into the carriage a somewhat difficult procedure; and although reasonably well-behaved, as behoves all AES members, I am afraid we were far from popular with the

courting couple who occupied the compartment with us.

H. E. HAMMOND (423).

*See AES Leaflet No. 18, "Collecting Clearwings."

SUBSTANCES FOR KILLING INSECTS

(Continued from p. 10)

(4) **Carbon tetrachloride** (CCl_4) is a heavy colourless pleasant-smelling mobile liquid, giving off a heavy vapour which has a somewhat similar anaesthetic action to that of chloroform, and which is poisonous in large doses, but harmless enough in small quantities. B.P. 76° C. (170° F.). It may be used as a killing agent in the same way as chloroform and has the same advantages and disadvantages. It is non-inflammable.

(5) **Carbon bi-sulphide** (CS_2) is a heavy colourless volatile liquid giving off, at ordinary temperatures, a heavy vapour, which has a repulsive odour; it is poisonous to breathe. B.P. 47° C. (117° F.). The vapour easily takes fire, much more easily than petrol, which does not boil under 70°C. It has few advantages for field work and the disadvantages are obvious, a serious one being that it often affects the colours, if the vapour is in too great strength.

(6) **Nicotine** ($\text{C}_{10}\text{H}_{14}\text{N}_2$) is a colourless, rather oily liquid giving a disagreeable odour and burning taste. With the possible exception of prussic acid, it is the most rapidly acting poison known. It gives off no vapour. B.P. 247° C. (476° F.). It is soluble in water. It occurs in tobacco not as free nicotine but united with malic acid; small quantities are found in the moisture of a pipe stem. I understand that some entomologists have killed insects by dipping a pin point in this moisture and inoculating them with it. They are rapidly killed and, from what I have heard, the colours are not affected, but I have no information as to their rigidity. Whether a solution of pure nicotine has been used for the same purpose, I do not know; but in view of the very poisonous nature of the substance, I should not advise it.

* * * *

For general field work, method No 2 with strong ammonia is undoubtedly the best, where there is no hurry required in taking specimens; any green Geometers can be separately

pill-boxed. The cork mats in the box should be soaked with the strong ammonia before each outing. Where hurry is necessary, Nos. 3 or 4 are quickly and easily managed, after a little practice with the dropping bottle on a few common species. It is best to use a cork or bung in the killing bottle—not a glass stopper, which does not absorb the chloroform, sometimes sticks and often gets chipped or broken. I have used this method for years and have had very few spoiled specimens. For young entomologists, beginning their work, No. 1 is handy and safe. If the specimens are left in the bottle only a few moments, until they stop moving about, and are then turned out into pill boxes, they do not become too rigid or set.

Should any members have used or propose using other substances, I will describe and comment on them in a future article, if the users will let me know the names of the substances and their methods of use.

H. HENSTOCK (209).

REVIEWS

The New Naturalist, A Journal of British Natural History. Editors: James Fisher and Elisabeth Ullmann. Published by Collins Ltd. 216 pp.+12 coloured plates +175 illustrations in black and white. Price 21/- (Sa.).

This book consists of four parts and is the first annual volume. It is apparently intended to publish quarterly parts when it is possible.

These four sections are devoted to Woodland, the Western Isles of Scotland, Migration and Local Natural History.

In the introduction the question is asked "Can we be too scientific?" and is answered by the writer "No," the reasons for this attitude being given. I am rather inclined to doubt this. As this and future issues are intended to cover the whole field of natural history in Britain, it would seem that its appeal should be to general nature lovers rather than to the specialists. However, no fault can be found in the present volume in this respect.

The articles, mostly written by well-known authorities, are excellent, and the exceptionally fine coloured plates and general photography should appeal to all types of naturalists. The section dealing with Migrants is particularly interesting.

Readers will be surprised to note that the Large Blue (*Maculinea arion*) exists on the Island of Rhum in the Western Isles, an entirely different habitat from that usually associated with this butterfly.

As can be gathered from the above observations, the volume is worthy of a place in the library of all interested in the natural history of the British Isles

S. M. HANSON (320).

The Butterflies and Moths found in the counties of Cheshire, Flintshire, Denbighshire, Caernarvonshire, Anglesey and Merionethshire. Compiled and edited by S. Gordon Smith, F.L.S., F.R.E.S. (Chester: pub. Chester Society of Natural Science, Literature and Art. 1948; 250 pp. 17 half-tone plates. Paper covers, 15/6; cloth boards, 21/-).

The publication of a new local list is always a matter of interest. It is from these local lists that the national distribution is compiled. This Cheshire and neighbouring counties' list will provide much material for the checking and bringing up to date of distribution maps. As might be expected, Cheshire has the majority of the records with the famous Delamere Forest bulking large among them; but the records from the other counties are of equal if not of greater interest.

It is good to note that some species (*Drepana binaria*, *Catocala nupta*, etc.) are spreading into the area, though this is offset by some which are dying out (*Malacosoma neustria*, *Thymelicus sylvestris*, etc.). *Plebejus argus* is said to be extinct now at Delamere, though no reason is given. It was locally common in 1921. Is this over-collection? Many species recorded as local varieties (*B. sphinx*, *P. palpira*, etc.) emphasise that the area has a northerly rather than southern situation.

Many Midland entomologists who take their holidays in North Wales will find this list helpful in deciding where to go.

The arrangement of the families, especially in the Butterflies, and also the Latin names, will probably arouse some argument among the experts. Fortunately, for the less expert, the English names are given, with a complete set of indices, English names, and family, sub-family, generic and specific names in Latin.

The plates are excellent reproductions of photos of a series of variations in the compiler's collection. (The name of the blockmaker is not given). Plate V, of female *S. pavonia* fed on apple leaves is quite striking. Special acknowledgments are made, in the list of Recorders, to a number of gentlemen, of whom, it is interesting to note, about a quarter are AES members.

The compiler and Editor, Mr Gordon Smith (478), is to be congratulated on a very well produced volume.

T. T.

Butterfly Miracles and Mysteries by Bernard Acworth.

I regret that I have to challenge not only the fairness but the accuracy of B.O.C. Gardiner's review of the above book (*Bull.* 95, p. 228). The Reviewer has played on certain items of detail only, when he speaks of departing so radically from the *proven* "truth." He completely omits the entirely novel suggestions of Acworth, in respect of butterfly flight and migration. Indeed, Acworth's *theory* of migration is, to date, the only one that appears to have any logical *reason* behind it. Facts will subsequently prove or disprove his theory, and, at the moment, one might dispute some of his postulations in regard to certain species. It is, however, a new and valuable theory and deserves great study, and related to this study the two laws of Currents must be of high importance and are also almost unrecognised at the moment.

The Reviewer scorns Acworth for regarding the Chalkhill and Adonis Blues as being the same species and asks—"Has he examined the genitalia?" Let us be fair to Acworth and recognise the extreme closeness of the relationship of these two Blues. Newman (*British Butterflies*) said, "I regret the necessity of acknowledging my inability to differentiate perspicuously the females of *adonis* and *coridon*." Of the genitalia, Pierce (*The Genitalia of the Butterflies*, 1941) says, "There is apparently no reliable difference between the male of this (*bellargus=adonis*) and *coridon*;" there is little difference apparent between the female organs either, so far as I can judge.

The Reviewer states that the author says that botanists should use butterflies as an aid to botanical classification. Acworth actually suggests that if open-minded botanists would study butterflies with plants, they would

solve many *butterfly* problems and aid *butterfly* classification.

The Reviewer also complains that the drawing of the egg of the Silver-Spotted Skipper is so crude, whereas it is a reasonable line drawing of Frohawk's Fig. 1, Plate 59 (*Natural History of British Butterflies*); Frohawk was a master of observation and drawing.

It is certainly a book for amateur and specialist who may read with profit and without wishing "to be amused," provided he is prepared to *think* on the subjects discussed and not be overwhelmed by some trifling divergence on matters of detail. Since we do not yet know correctly how many broods there are in a year of the Small Copper (*L. phlaeas*) in Britain, it is not surprising if some details cause argument. It is a thought-provoking book of far greater merit than the Reviewer has been able to find in it. I strongly recommend continued thought on Acworth's views.

P. SIVITER SMITH (250).

In answer to Mr Siviter Smith's criticism of my review, I should like to make the following remarks.

A review is the *personal* opinion of the reviewer. Mr Siviter Smith is entitled wholly to disagree with it.

With regard to migration, the facts accumulated and published over a number of years by Dr C. B. Williams and others do not support Acworth's theory, for which I failed to see any concrete evidence.

So far as I can ascertain, a male Chalkhill Blue has never been seen *in cop* with a female Adonis Blue or *vice-versa*. Certainly no fertile hybrids have been produced. And a species is, by definition, one that will not interbreed with another species to produce fertile offspring. I agree that they are closely related.

I also completely fail to see how a *copy* of Frohawk's drawing can be as good as the original drawing, let alone the original model. Too many books suffer from having drawings copied from other works and this is always to be deplored.

BRIAN O. C. GARDINER (225).

THE CAMBERWELL BEAUTY

CAPTAIN T. DANNREUTHER (60) writes to say that, up to Nov. 1st, he has received further records of *N. antiopa* bringing the total number of occurrences so far, in 1948, up to 30. (See *Bull.* No. 95).



The Amateur Entomologists' Society

MEETINGS NOTICE No. 8

ANNUAL EXHIBITION

This will be held on SATURDAY AFTERNOON, the 26th MARCH, 1949, at BUCKINGHAM GATE CENTRAL SCHOOLS, Wilfred Street, London, S.W.1.

The hall opens for the receipt of exhibits from 10 a.m. onwards, and the Meeting will be declared open at 2 p.m.

It is hoped that REFRESHMENTS may be obtained later in the afternoon.

Exhibits must be cleared from the hall by 6 p.m.

This is really a Members' Exhibition, but Visitors are more than welcome, particularly if they bring exhibits.

Bring all you can of entomological interest. Labels and short notices are desired, whenever possible, for each exhibit.

Anyone requiring an extra large amount of space for their exhibits should notify the Meetings Secretary beforehand. Offers of help and enquiries should be sent to:—

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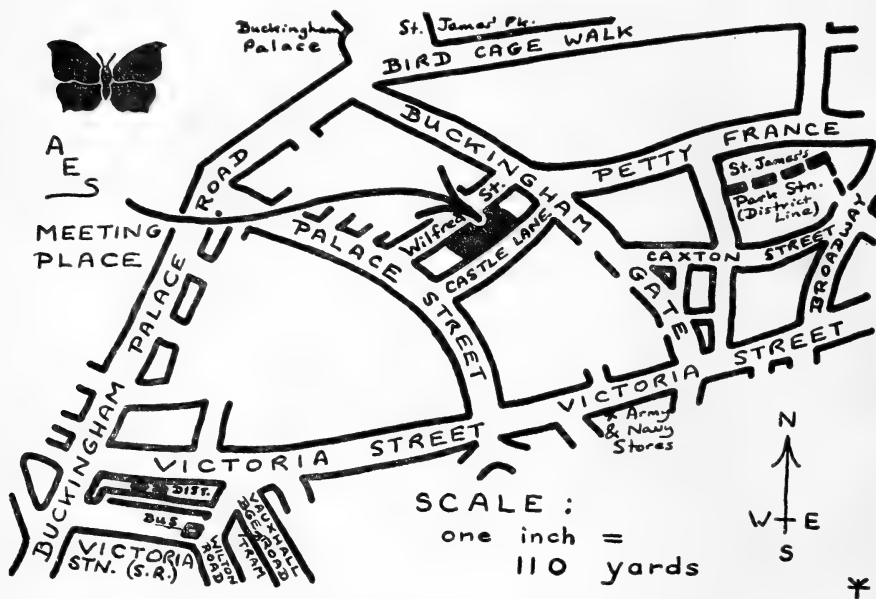
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ANNUAL GENERAL MEETING OF AES

After the exhibition, at 5 p.m., a General Meeting will be held to elect officers for the coming year. Reports on what has been achieved during the past year will be read, and proposals for the future made. All members are cordially invited to assist at this meeting.



How To Get There

The entrance to the Hall is in Castle Lane. Cars may be parked in the school playground inside the big gates in Wilfred Street.

UNDERGROUND (District Line) to Victoria Station or St James's Park Station, from King's Cross, St Pancras, Euston, Marylebone, Paddington, Baker Street, and Charing Cross; passengers from Waterloo take a 46 or 10 'bus from York Road to Army and Navy Stores, Victoria Street. Underground (tube) passengers change at Charing Cross and get on to the Westbound District, to St James's Park Station.

'BUS—Take a No. 11 'bus from Charing Cross (Strand), or No. 24, 34, or 139 from Tottenham Court Road or Trafalgar Square, and alight at Army and Navy Stores. The following 'buses pass through or terminate at Victoria: 2, 10, 11, 16, 24, 25B, 25C, 29, 36, 38, 38A, 39, 46, 52, 76, 134, and 290.

TRAM—The following trams terminate at Vauxhall Bridge Road, Victoria: 8, 20, 28, 54, 58, 66, and 78.

VOL. 8

No. 100

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**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

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EDITED by TREVOR TROUGHT, M.A., F.R.E.S.

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No. 100

BULLETIN

APRIL 1949

THE FIRST CENTURY

This Bulletin is No. 100. It is customary to mark a centenary in some way. So here goes!

We feel that something has been accomplished, but even more that something has been well *begun*. The Society and its Bulletin are now firmly established and, we hope, on their way to a greater and expanding usefulness. The future of the Society depends, of course, on the individual members—it is not sufficient to have what, in a different context, Quiller Couch called the “passionate few” to keep us going. Each member must be keen to help the Society, as opportunity offers, to increase its membership or share his knowledge. This means, maybe, a little more personal trouble for each member, but it is surprising how taking this little bit of extra trouble seems to *develop a desire to take still a little more*.

NEW KILLING AGENT

I have been asked for further details of the properties of tetrachlorethane (see *Bulls.* 94 and 95). In the Cambridge University Chemistry Library I found that:—

- (a) As a liquid, it is used as an industrial solvent (Westron) for paints, resins, fats, oils and a few pigments.
- (b) As a vapour it has no effect on these.
- (c) It is heavier than water.
- (d) Its vapour is heavier than air.
- (e) It is mildly inflammable (doubtful).
- (f) It is decomposed by the combined action of water and sunlight.

Obviously from (a) it must be kept off all these (especially varnishes, polishes and parts of the body). It is usually harmless to the skin, but may cause jaundice in a few rare sensitive types. It will not harm clothes and has been used as a dry cleaner.

From (e), if it gets mixed with water, most of it will separate on standing to form the *lower* layer. A little water will react with it, but this will not harm it noticeably—see

(f). It must *not*, however, be allowed to stand in sunlight in the open if it is likely to get wet. If it is kept out-of-doors it must be in a ground-glass stoppered bottle in the shade.

Concerning (e) I have tried to burn tetrachlorethane by applying a light to the liquid, and by burning paper soaked in it. In the first case it wouldn't burn, and eventually put the flame out. In the second, it merely evaporated off in front of the flame, which was thus slowed up considerably, but it would *not* burn (the vapour has the appearance of smoke). It might burn in high oxygen concentration.

PETER G. TAYLOR (719).

HINTS FOR JUNIOR MEMBERS

(Continued from page 14)

Relaxing Tins. A cheap, easily made relaxing tin can be constructed as follows: Procure a tin of about 9" x 6" x 3" with a good fitting lid. In the bottom of this, place a one inch layer of laurel leaves, which have first been chopped up and beaten with a mallet. This is best done by putting them in a bag made of calico or some such material. Cover these with a thin layer of cellulose wadding (better than cotton wool) and your tin is ready for use. With normal use, this tin should last a whole season.

Collecting Tins. When out collecting in hot weather one finds that captures become “set” before reaching home. To obviate this it is a good idea to use a tin of any convenient size and about three inches deep, in which pieces of cellulose wadding, cut to fit, are placed. One piece, soaked in water, is placed in the bottom of the tin and covered with cellophane. The other pieces are then packed in until the tin is almost full, but don't pack too tight or specimens will be damaged.

Kill all captures in *ethyl acetate*, and place them, when dead, between the layers of cellulose and they will arrive home in good condition ready for setting.

Larva Tins. These tins can be made from almost any good tin fitted with an easily removable lid.

Cut a circle out of the lid with a pair of tin-snips, smooth off the rough edges with a file and solder a piece of perforated zinc over this hole.

If the tin is given a coat of aluminium paint it will last much longer and look a better finished job.

Should the beginner be unable to solder, an alternative is to use some strong net material and fix with "Durofix," which is waterproof and very strong.

R. V. ALDRIDGE (262).

(To be continued.)

THE COUNCIL FOR THE PROMOTION OF FIELD STUDIES

If any member wishes to take advantage of the great opportunities offered by the Council for the Promotion of Field Studies, there is no time for delay. The programmes for the four Field Centres have been published some while ago and by the time this is issued many applications will have been received for vacancies at the Courses.

The AES is affiliated to the Council for the Promotion of Field Studies, so members should quote their AES membership number when writing.

There are several entomological courses proposed at the Flatford Mill Field Centre, East Bergholt, near Colchester, Essex. At Juniper Hall Field Centre, Mickleham, near Dorking, there are Natural History and Ecology courses, while Malham Tarn Field Centre, near Settle, Yorkshire, has Biology and Plant Ecology courses. The work at Dale Fort Field Centre, near Haverfordwest, Pembrokeshire, includes Marine Biology, Plant Ecology and, of course, Bird Courses.

Further information should be obtained from the Wardens of the Field Centres or from the Director and Secretary, Council for the Promotion of Field Studies, 10 Exhibition Road, South Kensington, London, S.W.7.

ORTHOPTERA

JAMES A. RANGER (1002*), of 54 Cherry Crescent, Brentford, Middlesex, would welcome records from other members on the habits and habitats of British Orthoptera, particularly recent or fairly recent records from Middlesex, Surrey, Kent

and Essex. Any notes on habitat—for example, dry heaths, meadows, woods, etc.—and approximate locality, as well as general information, are specially important.

A PARASITIC BEETLE

During August 1948, when destroying some wasps' nests, I was very much pleased to find some specimens of the parasitic beetle *Metoeus paradoxus*, which I had never seen alive before.

The first nest, which belonged to *Vespula vulgaris*, situated in a rockery, produced a male beetle from the centre cells. On the 14th August I removed another nest of *vulgaris* from under a grass tuft beside a path in the orchard; this nest produced a female—again near the centre.

During September, while walking down a garden path in Watton, Norfolk, my attention was drawn to what, at first, I took to be a wasp trying to chew a large fly, as I have often seen them do before. But on closer examination I found it to be a female *Metoeus*.

What puzzles me is why this wasp (a *V. vulgaris*) was attacking a beetle which is allowed to wander unmolested around its nest. All the specimens mentioned are now in my collection, including the wasp and the headless body of the unfortunate female *Metoeus*.



M. paradoxus.

A few words of description and life-history will be of interest to those wishing to identify this beetle, which is by no means common.

Both sexes are approximately $\frac{1}{2}$ " long; the antennae are plumed, and the legs are long, very thin and black in colour. The elytra, which are yellow in the male and black in the female, imperfectly cover the abdomen, which is yellow in both sexes. The top of the thorax is yellow, with a deep central furrow, which is black.

The female either lays her minute eggs at the entrance of a wasp's nest or on palings where the wasps go to collect wood pulp. When hatched, the young attach themselves to the underside of the host and are transported along to the nest by the returning wasp. Finding a nice fat grub, the little parasite bores into its body just behind the head and feeds first on the internal organs, then on the dead or dying remains of its host. During this time it moults twice and finally pupates; very shortly it emerges as a fully-fledged beetle—just as I found them in the nests of *V. vulgaris*. They also inhabit the nest of *Vespa germanica*.

K. C. DURRANT (1935).

OBITUARY

It is with the greatest regret that we record the death, on the 27th December 1948, of Mr J. Walker, of 7 Mount Hermon Road, Ellacombe, Torquay, at the age of 78. Many of those who knew Mr Walker in his active years will already have passed on, but it is not fitting that a man, who was compelled, by illness, to live a retired life for some years, should be allowed to slip away without due and adequate acknowledgment of his attainments in the entomological niche he had carved for himself. In his younger days he was a resourceful and indefatigable worker, after his first interest had been aroused by taking home a stray caterpillar. Using a second-hand copy of Newman, a small handbook of wild plants and home-made apparatus, he amassed an immense amount of knowledge and a beautiful collection of Macro-Lepidoptera. His knowledge of the *Noctuidae* and their larvae in particular was impressive and his advice and information on these seemed inexhaustible. Members will recall his notes on the Jersey Tiger in *Bulletins* 66 and 69, and his practical assistance is more than once acknowledged in South's books. Mr Walker corresponded

with a great many members, young and old, and was a great "ex-changer." He was always ready to assist in the identification of specimens and had a fund of entertaining and instructive reminiscence. He was one of the very early members of the AES and did a great deal to help the Society in its early struggles and difficulties. Peace be with him and good hunting in the Elysian Fields.

REARING THE ORANGE TIP

I read the note on breeding Orange Tips (*Anthocharis cardamines*) in *Bull.* 83, p. 107, by Mr S. G. Castle Russell (119), and as I have bred the species for several years, I venture to give my method, which I have always found very successful.

I use meat paste pots, in which are placed three corks, with holes bored down their centres, such as are used for lighter-fuel bottles. The corks are packed into the jars with wadding. Into these holes I place a twig of the food-plant and spray outwards. The first sprigs of the food-plant to be put in are those, collected wild, with the eggs on them.

When the young larvae appear I am able to watch them through till just before they pupate. Knowing there are only three larvae to each jar, one can keep a check when fresh food is wanted. I find the larvae do not wander and have never covered them up at all.

When nearly full fed I transfer each larva to an ice cream cup (the wax type) with a few seed pods, and then cover with a small sheet of glass to each cup, or one larger sheet to several cups standing together. I find the larvae pupate without any further trouble at all, either on the side of the cup, or on the pods of the food-plant.

I hope this note will be of use to some of the young entomologists.

H. L. DOLTON (1122).

THE INVERTEBRATE FAUNA OF GRASS-TUSSOCKS

In my recent brief preliminary paper on this subject (*Ent. Mon. Mag.*, 1948, 84: 169-174) I find that I, most regrettably, had entirely overlooked, and so made no reference to, a relevant paper by my former contemporary and friend at Cambridge, G. L. R. Hancock ("On some hibernating Ichneumonidae from the Cam-

bridgeshire Fens, *op. cit.*, 1923, 59: 152-8). My attention has kindly been called to this omission by my friend, Mr W. D. Hincks. Hancock's paper deals with some eighteen species of *Ichnemonidæ* found in tufts, etc., and contains the interesting assertion that "Quite 90% of the tuft and bark-hibernating fauna on the fens belongs to what economic entomologists term 'beneficial insects.'" If corroborated by adequate evidence, this statement would give further point to the last paragraph of p. 173 of my paper.

Judging from the correspondence I have received and by the requests for separates of my paper, it has aroused considerable interest. I would like, therefore, to emphasise the reference I have here made to Hancock's paper, and so go some way towards repairing my previous omission to refer to it.

E. J. PEARCE (796).

(Cf. *Abstract in Bull.* 97.—Ed.)

COLEOPTERA COLLECTING IN SOUTH AFRICA

In 1940 I was sent to S. Africa and stayed there until early 1945. My wife and I studied Coleoptera extensively during this period and hope that the following notes may be of interest.

Entomology as a hobby is practically non-existent in S. Africa, almost the only active workers being government entomologists, mainly concerned with pest control, and a few enthusiastic museum workers. My wife and I were fortunate in meeting the late Mr H. W. Bell-Marley. I should like to pay tribute to this great naturalist. Although his name seldom appeared in scientific journals it is to be found on data labels of S. African insects in practically every major museum throughout the world. Almost every year for the past forty years he went up to Northern Zululand and lived with the natives for about a month while collecting in the fever-infested area between Obombo and Lake Sibayi on the coast. During his visit in December 1945 he contracted blackwater fever and died shortly after his return to Durban. It was a great privilege to have his advice and companionship during our long stay in the country.

Although we were able to do some collecting in Central, West and East

Africa, the great majority was done in South Africa and, except where otherwise stated, the following remarks apply mainly to Natal and particularly to the sub-tropical coastal belt on the east coast stretching from Port Shepstone up to the Portuguese East Africa border—a distance of about 400 miles. The northern part of this coastal stretch is one of the most prolific insect areas in the world but is as yet almost untouched owing to lack of roads, lack of white habitations, and the unhealthy nature of much of the terrain. Permission from the South African Government is necessary before one may collect in these areas, as they are native reserves.

Apart from Mr Bell-Marley's amazing knowledge of S. African Coleoptera, our main guides were the extensive works of Peringuey in the *Annals of the S. African Philosophical Society* and the collections in the Capetown and Durban museums. However, when taking into account the vastness of the area, the complete lack of specialist workers, the extreme local variations in climate, topography and vegetation and the difficulty of access, I personally think that the percentage of the coleopterous fauna as yet undescribed would be as high as anywhere in the world.

The collecting season begins in October and continues until March, the average shade temperature on the east coast then being about 80° F. with a fairly high rainfall. The winter months (April to September) correspond so far as collecting is concerned with the winter in this country, when hibernating species only are found. Although the Natal winter is warm and dry, collecting is very seasonal and few insects were obtained by normal collecting methods during much of this period. The best collecting month is December and the hottest month is February, with shade temperatures of 90° to 100° F. and humidity up to 90% on the coast.

Most normal collecting methods were found to be highly profitable, but a high proportion of species was obtained by beating and by working excrement of various kinds. Beating can be quite exciting as very large spiders, small snakes, stick insects, chameleons and other unwanted guests often dropped into the

tray. Certain species of bush wasps were inclined to be very aggressive when disturbed and ticks were a source of annoyance. Certain good collecting areas quite near Durban had to be avoided altogether owing to the prevalence of dangerous snakes such as the Puff Adder and Green Mamba.

Cicindelidae are well represented, but although a few species are common the majority seemed to be rather local. *Carabidae* are very numerous and large Bombardier beetles (*Brachinus*) are not uncommon. The genus *Anthea* occurs inland in the drier areas and their size and speed are very impressive.

The *Dytiscidae* are also numerous and some species of *Dytiscus* closely resemble those found in this country. A number of species of *Gyrinidae* are common and one or two very large species can be found. I formed the impression that the water beetles as a whole have been somewhat neglected in the few S. African collections seen.

A dozen or so species of the myrmecophilous family *Paussidae* have been described from Natal, and although we took some from ants' nests, the majority were taken at light. *Staphylinidae* are well represented but are not particularly numerous. Few S. African Staphylinids are as large as some *Staphylinus* found in this country.

The *Buprestidae* are generally rather local in the area and are only in evidence in the extreme heat of the day. The smaller species are exceedingly difficult to catch owing to their agility when settled and their exceedingly rapid flight. Most of the *Elateridae* captured were taken in rotten wood or under bark and a few species are very large. Protective colouration is a predominant feature of the S. African species.

(To be continued.)

L. S. WHICHER (1345).

ADVISORY PANEL CHANGES

Mr S. E. Bland (1328), of 20 North Street, Exeter, has offered to advise members on books dealing with *Hymenoptera*, with particular reference to the honeybee.

This offer gives us four advisers on *Hymenoptera*, but we are not so fortunate with some of the other Orders.

With the resignation of Lt.-Col. F. C. Fraser (890), the only adviser on *Megaloptera* and *Neuroptera*, there is a vacancy to be filled. Will some member kindly undertake to give general advice on these Orders?

S. M. HANSON (320),
Hon. Secretary.

EDITORIAL

The time has come, the Editor thinks, to ask members for their views on the *Bulletin* and its contents. But as the contents of the *Bulletin* depend on the contributions of members, those members who would like something different have the remedy in their own hands. They can write the type of article they favour and send it to the Editor.

It is, naturally, quite impossible to please everyone all the time. But it may be said, in general, that the *Bulletin* is not intended to be a "scientific journal"; it is for young and old, beginners and experts and for all interests. There is a preponderance of articles on butterflies and moths, as the majority of the members are lepidopterists. But will not members interested in other Orders make contributions and restore the balance?

However, send along your views; the Editor will welcome constructive criticism and would also like to hear from those who are quite content.

With regard to the *Journal*, the Editor would like to give members a word of hope. Things are moving now.

VISIT TO SWITZERLAND

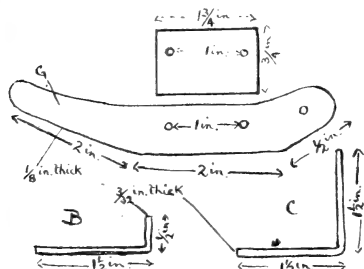
Mr M. H. Port (Youth Secretary) and Pro Juventute are organising a party of young members to go to Switzerland at Easter, on the "exchange" basis.

Our members would stay with Swiss families, and undertake to entertain a Swiss guest in the summer. The cost of the visit, lasting a fortnight, should not be more than £16.

Members aged less than 24 are invited to apply, giving their age, occupation, and interests. Applications must be made *immediately* to Mr M. H. Port, 31 Pinner View, Harrow, Mddx.

A HOME-MADE MOUNT-CUTTER

The sketch below shows the details of a mount-cutter which I made some years ago for trimming the cards on which Coleoptera and other insects are mounted. The dimensions shown need not be adhered to strictly.



Details of mount-cutter.

"A" is the base of black fibre, size $3\frac{3}{4}'' \times 2\frac{3}{4}''$. Hard wood would probably prove serviceable.

"B" is a mild steel bracket for the blade handle pivot bolt. It is secured to the base with 2BA bolts, with the nuts let into the underside of the base.

"C" is merely a blade handle guide, to prevent the handle twisting over and fouling the base plate "F." It could probably be left off as not strictly necessary.

"D" is the blade itself, and is made of stainless steel, of the size shown, and is approximately $\frac{1}{16}''$ thick; it is sharpened to an angle of 45 degrees.

"E" is the pivot bolt 2BA tapped into "B." A thin washer is fitted between "B" and "G," and a suitable spring is fitted under the pivot bolt head to keep the blade up to the base.

"F" is a thin steel plate secured to the base by four suitable screws and marked off in $\frac{1}{8}''$ or m/m lines parallel and at right angles to the cutting edge.

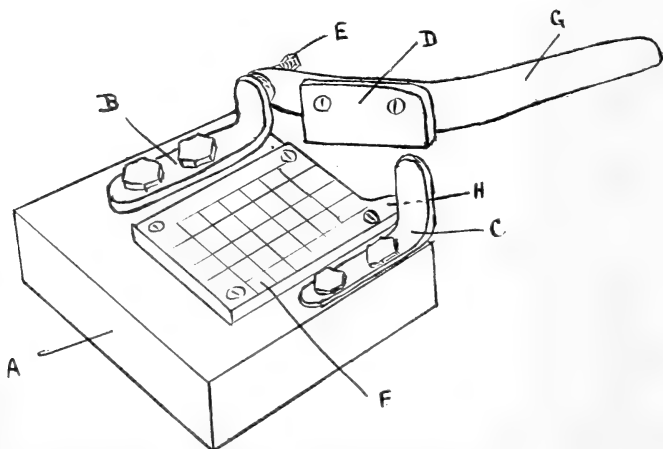
"G" is the blade handle of aluminium, having similar holes to those in the blade to take 4BA bolts and nuts.

"H" is a projection on plate "F" to prevent the handle "G" from going too low after cutting and damaging the table on which the cutter is being used.

By using the lines on the base plate, the cards of mounted insects can be trimmed really square, parallel and to a definite size.

This device has been in use over a number of years and gives very regular-looking mounts with very little practice. I should be glad to give further details to any member on any points which are not clear from the above description.

W. J. DURRANT (1196).



Sketch of mount-cutter.

REARING THE SWALLOW-TAIL

I had the delightful experience of rearing this magnificent butterfly in 1945. A young friend brought back for me from Burton Turf in Norfolk three live female *machaon* and a large bunch of Milk Parsley. But for that, the experience might not have been mine for some years, for to get to most of the distant butterfly habitats of Britain at certain specified times, and to be given the correct kind of weather for the job, is not easy, even in a lifetime of collecting. Since one of my joys in rearing butterflies is to compare notes with others who have done similarly, I venture to describe some of the *minutiae* not usually found in textbooks.

I know nothing of the temperament of the captive female *machaon* in regard to egg-laying generally, but these three females did very well for me. Their tattered condition was proof that they had been on the wing for some time and had most probably paired. They were each put down into 10" flowerpots containing a bottle with a bunch of Milk Parsley, and some carrot leaves. The bottles were well sunk into the soil, and the pots covered with old net-bags supported on high wire struts. Each butterfly was well fed with dilute sugar and syrup each day, the proboscis being unwound and the insect held, until feeding started in earnest. They each lived almost a fortnight and between May 30th and June 5th, in spite of much dull weather, they laid a total of 82 eggs.

The eggs were carefully snipped from the Milk Parsley and put into glass-topped boxes, fifteen to the box. No eggs were laid on the Carrot, even though I renewed this twice a week. It seems strange that the insects preferred to lay on the Milk Parsley even though the last eggs must have been deposited when the leaves were tough and lifeless. The changing colour of the early ova gave me the hope that some at least were fertile. The first larva emerged on June 7th, and the last on June 20th. Ten ova proved to be infertile, although some colour change occurred in all of them.

The antics of young *machaon* larvae were fascinating to watch. The dark purple blotch of the ovum would resolve itself into the head of a larva which gnawed its way out of the shell. After five to ten minutes

it would turn completely round on its anal claspers and face the empty shell, which it would begin to eat. This was the general practice, though I found a few uneaten egg-shells. Some ate only a little of the shell, others almost the whole lot. Then came a pause in which the larva remained motionless. Incidentally, to pick up the larva in order to place it on the foodplant necessitates the negotiation of a fine and very determined thread. I found that it was easy to entangle a larva with its own thread and so cripple it for some time. The different "temperaments" of the larvae also become evident in the course of this manoeuvre. Some larvae put out their osmaterium, even at this age, as soon as the sable hairs came near them, and appeared very much like youngsters putting out their tongues.

I raised the young larvae through the first two instars in cages made by four half-plate negative glasses hinged with surgical tape and covered with fine gauze. Rearing throughout was done indoors, where a fairly even temperature and an hour or two of sunshine per day—which the larvae appeared to enjoy—could be maintained. After the first instar, only six larvae were allocated to each of these cages, though in the last instar the larvae were moved into garden seed-boxes, twelve to a box. Several seemed to develop trouble with their first moult and died in the effort.

Once placed upon the foodplant the young larva settles down quickly to its job and eats steadily throughout daylight hours. I wasn't able to determine whether *machaon* is also a night feeder. I fed my larvae on garden Carrot leaves, except for a small batch which, during their last instar, I placed, as an experiment, upon a large assortment of wild umbelliferous plants. None of the leaves I offered seemed to come amiss, and all were, to some degree, eaten. I have a prejudice against changing the foodplant of a caterpillar when once it is settled. Hence I stuck to Carrot, though I understand that both Wild and Garden Parsley hold high priority as satisfactory foodplants.

After each of the three moults, the larvae eat their old skins, either wholly or leaving only the head and adjacent segments. This apparently

essential *hors d'oeuvre* is taken with amazing determination and gusto. Nothing turns the larva away from this meal when once it begins. After it, there is a long rest: Indeed, the meal is preceded by a long rest taken usually in a far corner of the cage or upon the tip of a denuded midrib or the foodplant. I made a special point never to touch or disturb the larvae in this rest. *Machaon* are the type of larvae which at no time in their lives should be touched or man-handled. Their anal claspers are very powerful and it would be fatal to pull them away from a leaf.

The last instar is the most dramatic part of *machaon's* larval life. The rate of growth, often from $\frac{3}{4}$ " to $1\frac{1}{2}$ " in less than a week, the evacuation of the alimentary tract previous to pupation, and finally the long wanderings of the larvae, are all, at first experience, astonishing. When my eldest larva hung itself on the side of the box and began to emit the purplish orange contents of its tract, I was sufficiently worried to prepare to isolate the beast against disease. This function, much less dramatic in most larvae, is apparently quite normal and all my larvae went through the process. I recommend the bases of the cages to be well layered with blotting paper beforehand. After evacuation there comes a strange change over the fairly slow-moving larvae. They are no longer interested in food. They begin to move about with alacrity, lifting their heads at intervals to investigate their surroundings. They show greater activity than ever before. If one of them walks across the base of the cage and encounters a piece of frass, it often picks up the pellet in its jaws and throws it out of its path. This indeed is a comical sight and I note that Tutt refers to it in a quotation from the observations of Scudder.

The larvae walk for as long as three days up the cage sides over the foodplant, up reeds placed in the cage for pupation, ceaselessly. They must accomplish a very long hike—Tutt computes this as 200 to 300 yards in kindred species. I soon noticed, however, that the walking is done mostly, if not entirely, in daylight hours. Hence I put my "hikers" in a darkened biscuit tin with its sides covered with newspaper. They settled down to pupation straight

away in this and so I avoided their climbing over feeding larvae and newly-formed pupae. Further, the pupae can be cut from the newspaper and overwinter more conveniently.

(To be continued.)

THOMAS W. JEFFERSON (242).

FIELD MEETINGS 1949

April 3rd—Darkestone Wood. Meet main road at base of hill in Darkestone Wood. Darkestone, Leicester, at 12 noon. Leader: O. M. White (140), 78 Eastdale Road, Nottingham.

May 8th—Canvey Island, Essex. Meet Benfleet Station 11.15 a.m. Leader: Epping Forest Group. 1 West Ham Lane, London E.15.

Dates of further meetings will be given in the May *Bulletin*, No. 101.

A LAMENT

He (or would it be more correct to say she?) was merely a beetle; a solitary, self-effacing, slow moving, insanitary cellar beetle. He seemed to have neither friends nor foes, unless perchance during the course of his slow meandering he should be unfortunate enough to run up against a domestic heel. This, however he avoided, like a famous Duke of past days, by a preference for taking his exercise after dark.

His outward appearance was unattractive—he knew nothing of the "new look." Far from it. He, his parents, his ancestors had worn the same suit for a millennium or so. He wore neither frills, nor flounces, nor furbelows and, if report speaks correctly, exhaled at times an odour which was nauseating to humans.

But not so, apparently, to mice—for he spent the daylight hours down a mousehole from which issued an almost continuous series of house and wood mice into a warm kitchen seeking what they might devour, totally oblivious of the fact that many of their relations never came back to report upon the delicacies which the said kitchen provided. They, like the wicked, did not amend their ways though their brethren perished almost within their sight.

Now why so few returned was that the owner of the kitchen had placed two tin biscuit-boxes against the wall—one upon each side of the said mousehole, leaving a passage way between, just wide enough to allow of a spring trap to function therein.

This it had done upon many occasions, thus reducing the mouse population of the vicinity by some 50 or more individuals.

Inasmuch though as it was found that at times the trap was set too "unlightly" to perform its duties, a second trap was added directly behind the first one. These traps were sprinkled with dainty farinaeous food, nor was it long before our lonely beetle found that a plentiful and cheap meal was provided for him without his having to move himself far from his dark abode. On several occasions it was found at rest upon one or other of the traps replete when morning came. And then during one unfortunate night came the tragedy long expected by the trap-setter. A mouse sprang the near trap to the hole which, leaping into the air, fell across the second trap, springing it also just at the moment when our friend the beetle was having his usual supper, and, as ill luck would have it, just as he was beneath the spring, which came down across his sombre, tough back, pinning him to the wooden floor and so completely putting an end to his perilous peregrinations.

There he was found in the morning, an old friend seemingly gone to a country whither some fifty users of the same passage-way as itself had preceded him.

However, when the trapper, almost with tears in his eyes, came to remove his self-effacing, solitary — and singular, in two senses—little friend, he found to his intense surprise and satisfaction that his antennae were waving much in their usual way. Indeed, it seemed but little affected by its abrupt adventure; and when placed outside the kitchen door passed out of our little tale.

Time alone will show whether he was as solitary a little chap as he appeared to be—or whether he (or was it a she?) was always the same beetle, who had enjoyed many an unpaid-for meal in the 15th century kitchen.

REV. A. DALBY (1527).

NOTICE

Water Life and Aquaria World, published by Poultry World Ltd., Dorset House, Stanford Street, London, S.E.1, bi-monthly; annual subscription, 15/9.

This periodical was revived in 1946. Those amateur entomologists who are

also aquarists may like to know of its re-issue. It deals with far-ranging and varied subjects of a finny nature.

AES PUBLICATIONS

LABEL LIST (3/6) and Check List (1/6) of British Lepidoptera (together 4/3). Label List of British Butterflies (4d). The Hymenopterist's Handbook (7/10). [To non-members, 10/10]. Experiments with Bees (AES Leaflet No. 10, recently published), 7d each; 5/- per dozen.

DATA LABELS—4½ point (diamond) labels are printed in multiples of 125 for one wording. 4-line, 12/6 per 1000 (7/- per 500); 3-line, 10/- per 1000 (5/- per 500); sex signs, 1/- per 200. Other labels can be printed to members' requirements.

These, and other AES Publications, may be obtained from the Publications Sales Manager, C. B. PRATT, 1 West Ham Lane, London, E.15.

WHERE TO WRITE

Articles, drawings, etc., for the Bulletin to: TREVOR TROUGHT, Brookland, Tysoe, Warwickshire.

Articles, drawings, etc., for other AES publications to: B. A. COOPER, 27 Spilsby Road, Boston, Lines.

Non-arrival of Bulletins should be reported to E. LEWIS, 8 Parry Road, London S.E.25, with correct postal address.

Exchange Notices and advertisements to: E. LEWIS, 8 Parry Road, London S.E.25. (To reach him by 15th February, April, June and September.) Also requests for literature for prospective members.

Notice of change of address to: J. COWLEY, Holywell House, Edington, Bridgwater, Som.

Subscriptions to: G. B. HODGES, 12 London Road, Baintree, Essex.

Offers to lead field meetings, exhibit, etc., to: D. P. GOLDING, 517 Fooks Cray Road, New Eltham, London S.E.9.

Applications for new membership to: S. M. HANSON, 167 Gunnersbury Park, London W.5. Also offers of help with AES work, and suggestions for improvements in our organization.

Silkmoth Rearer's Handbook, Data for the revised issue to: W. J. B. CROTCH, 5b Stanley Crescent, London W.11.



"What have they been doing, dear?"

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No. 101

BULLETIN

MAY 1949

LEPIDOPTERA COLLECTING IN
MAY

It is more difficult to lay down a lepidopterist's time-table in May than in any other month: so much depends on the forwardness or lateness of the season. The transition from spring scarcity to summer plenty is often extremely sudden; the collector should make sure that he is prepared for it, with all his tackle, breeding-cages and setting boards in good order.

May butterflies include the Swallow-tail (*P. machaon*) in Broadland at the very end of the month, the Wood White (*L. sinapis*) in southern woodlands and the Pearl-Bordered (*A. euphrosyne*) in woods and clearings. Here is a small selection of the likeliest moths:—

Beehawks (*Hemaris fuciformis* and *tityus*) at flowers, especially huckle; Humming-bird Hawks (*Macroglossum stellatarum*) at flowers; Lime and Poplar Hawks (*Mimas tiliae* and *Laothoe populi*) sometimes newly-emerged on the stems of their food-plants; Small Elephant (*Deilephila porcellus*) at rhododendrons. (In my youth I was always envious of the owners of rhododendrons; I associated them with the Very Rich, and I used to poach Elephant Hawks at the rhododendrons in the Lord of the Manor's garden—an exciting sport).

Alder Kitten (*Harpyia bicuspis*) and Puss (*C. vinula*) (though I confess I have never found the latter and I suspect that 99% of the specimens in collections are bred); Swallow Prominent (*Pheosia tremula*) and Lesser ditto (*P. gnoma*), both at light; Pebble Prominent (*N. ziczac*) sometimes on tree trunks; Chocolate-tip (*Clostera curtula*) and Marbled Brown (*Drymonia dodonaea* = *trimacula*) at light.

Pale Tussock (*D. pudibunda*) occasionally on fences; the Emperor (*S. pavonia*) which flies devilish fast, generally over rough ground and, except by sprinters, is best bred; Green Silver-Lines (*Bena fagana* = *prasinana*) at light; Muslin Ermine (*Cyenia mendica*) females are often

found by day sitting on low herbs in damp places, and sometimes fly during the daytime, but the males fly at night.

Knot-grass Dagger (*A. rumicis*) often on tree trunks; Cabbage Moth (*M. brassicae*), Flame (*Axylia putris*) and Treble Lines (*Meristis trigrammica*) are sometimes common at sugar; Mullein Shark (*Cucullia verbasci*) sometimes sitting on posts; Small Yellow Underwing (*Panemeria tenebrata*) flying in sunshine in grassy places.

One or two Clearwings (*Sesiidae*) are out in May, including the Hornet (*Sesia apiformis*), which I have found sitting in the sunlight on the stems of small poplars.

Beating hedges or bushes in woodland rides will often rouse a good many geometers, especially the Carpets and the Waves. You will probably see that very pretty little moth, the Speckled Yellow (*Pseudopanthera macularia*), flying in woods where it is locally abundant, and you may take the fine Purple Thorn (*Selenia tetralunaria*) and the Scalloped Hazel (*Gonodontis bidentata*) at light. A number of Pugs (*Eupithecia* spp.) are met in May but it is best to mark down their habitats and go back later for the larvae: Pugs captured on the wing are generally very shabby. The Brown Silver-Line (*Lithina chlorosata* = *petraria*) is common in bracken places, the Bordered White (*Bupalus piniaria*) where there are firs, and the Latticed and Common Heaths (*Chiasmia clathrata* and *Ematurga atomaria*) on waste land.

Beating for larvae, both by day and night, is generally the most profitable entomological operation in May. You will often get scores of geometers in this way but they should be sorted out and separated because different sorts even from the same foodplant do not as a rule do well together. Hawthorn-bushes will provide you with the curious flattened little caterpillars of the Short-Cloaked Moth (*Nola cucullatella*) which are easy to overlook in the beating-tray—they are fullfed about

the middle of May—and also with plenty of Figure of Eight (*Diloba caeruleocephala*). On sycamores in a wood near my home I get quantities of Copper Underwing larvae (*Amphipyra pyramidea*), with their rather sphingid-like backward-curving horn on ring eleven, and Feathered Thorn (*Colotois pennaria*), both of which are ready to pupate at the end of the month. If you want a series of the Drinker Moth (*Philudoria potatoria*) you can, this month, easily collect a dozen larvae from any sunny hedge-row with rank grassy verges.

JOHN MOORE (146).

ADVISORY PANEL

Will members please note that Mr W. L. Rudland, F.R.E.S. (249), is, unfortunately, unable to continue the task of Lepidoptera identification. Our thanks are due to Mr Rudland for his past services.

Mr R. E. Parsons, F.R.E.S. (1512), the adviser on Indian Lepidoptera (see *Bull.* 96, p. 231) has moved to Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. Future communications should be sent to this address.

S. M. HANSON,
Hon. Secretary.

A WORD FOR PARASITIC DIPTERA

Mr Goodbody's (1470) article, "Are Cryptic Devices a Protection against the Insect Foes of Caterpillars?" (*Bull.* 98, p. 7), prompts me to say a word for the parasitic *Diptera*.

I understand Mr Goodbody was unfortunate in being unable to complete his observations, but our knowledge of the parasitic *Diptera* is built up by similar observations, if the parasite and host are accurately determined and breeding notes carefully made. Great numbers of our members breed insects of various Orders and no doubt often have parasites emerge instead of the insect they expect. I am not asking everyone to obtain a working knowledge of the *Tachinidae*; that is not necessary. It is necessary, however, correctly to determine the host. The parasite then should be sent, preferably unset and in a relaxed condition, with all available data, to the British authority on Tachinid parasites: Mr H. L. F. Audcent, M.Sc., Selwood House, Hill Road, Clevedon, Somerset. Each fly could be wrapped in a

scrap of tissue paper on which the data could be written in waterproof ink, then these should be sent in a tin containing a little chopped laurel. Now this is not much to ask of members, but I feel sure if every member did this Mr Audcent would receive some interesting material for his researches. Now what about it, members? Let's make it a parasite drive this year. Remember the motto on the cover of an eminent contemporary:—

"By mutual confidence and mutual aid,
Great deeds are done and great discoveries made."

The same arguments apply, of course, to parasitic *Hymenoptera*, but these were dealt with by Mr Kerrich in *The Hymenopterists' Handbook*, p. 126, and in *Bull.* 81, and members are referred to those notes for dealing with any such parasites which emerge in their breeding cages.

KENNETH G. V. SMITH (897).

THE LATE MR J. WALKER'S COLLECTIONS

The Editor has received a letter from Miss Walker, saying:—"I wonder if your members would be interested to know what has become of his fine collections. Before he died he expressed the wish that they should be given away, but he became too ill to deal with the details of the bequest. We have, however, found most suitable 'homes' for them. The British Collection has been accepted by Seale Hayne Agricultural College, for students' reference in their entomological department. The Foreign Collection has been given to Dartmouth Royal Naval College, where it will be housed in the Hobbies Rooms for the use and enjoyment of the Cadets, who are encouraged towards interests which they can pursue on their foreign service. My father was always ready to give up time to encouraging boys to become collectors, and we are so happy that his collections will now be accessible to so many generations of boys in his own county, which he loved so well."

All members will rejoice that these collections will retain their individuality and pay homage to the public-spirited action which has made this possible.

MELANIC VARIETIES

With special reference to H. G. Binnings' (1927) note in *Bull. No. 97* concerning Melanism in the Marbled Minor (*P. strigilis*) and in the Peppered Moth (*B. betularia*), I would like to add the record of 12 male *betularia* which I assembled to a female in one night in 1947:—2 were typical, 2 were intermediate, and 8 were var. *carbonaria* (geneticists forward!). I find that most of my Marbled Minors are of the melanic form.

Aren't all Dots (*Melanchra persicariae*) black with a prominent white spot?

PETER G. TAYLOR (719).

LATE APPEARANCE

It may be of interest to members that on 23rd October 1948 I observed the Large White (*P. brassicae*), Small White (*P. rapae*), and Red Admiral (*V. atalanta*) and the Vapourer Moth (*O. antiqua*) all flying at Cherry Hinton near Cambridge. The Red Admiral was beating hard in a southerly direction.

Concerning the Red Admiral, it would be very much appreciated if members would keep a particularly sharp lookout for single examples of migrants flying south in the autumn, as some observers believe that there is a general but scattered migration back south in the autumn of those species which fly north in the spring. Reports should, of course, be sent to Captain Dannreuther.

PETER G. TAYLOR (719).

REARING THE SWALLOWTAIL

(Continued from p. 25)

After its last ecdysis the *machaon* larva is a truly magnificent creature. Its tiger-like colouring must be seen to be fully appreciated. Yet in the last instar this powerfully-built larva appears most susceptible to disease. In spite of scrupulous care in cleanliness, fresh dry food, and ample spacing, I lost ten fully-fed larvae to disease. Prevailing weather, humidity, contact with frass—inevitable in captivity—must play some part as contributory factors. I understand that *machaon* is very liable to disease in captivity. My young friend, to whom I gave half the larvae after they had completed their first ecdysis, had disastrous results due to disease

and diarrhoea in the late larval stages. The larva when diseased ceases to feed, becomes limp, and loses all control of its prolegs. Hanging on by its claspers, it slowly turns black. I isolated all my suspects straightaway and maybe saved wholesale catastrophe.

No account of the life-cycle of *machaon* is complete without reference to the peculiar odour emitted by the caterpillar when disturbed. I found this only during the last instar: it was made by certain of the larvae only, and was, as far as I could see, not accompanied by the protrusion of the osmaterium. The foul odour, likened to rotten Pineapples, is obviously a weapon of defence, as one can well imagine. At the same time, its presence must be a certain signal to the larva hunter in the Broads.

I expected some butterflies to emerge in the summer and anticipated some pretence at chronological order—first in, first out. The first larva to pupate did so on July 24th, the last on August 4th. The later pupations were those of the "laggards," as Tutt calls them. These are the larvae that are days behind their fellows. My last laggard accomplished its final ecdysis on July 27th, and feeding after that was very rapid. Strangely, it was from the last lot of pupations that the four imagines emerged, on August 8th and August 10th (1945).

Much to my joy and surprise, the three perfect imagines are well up to standard size. Indeed, the female of the party appears to be an "out-size" of her tribe.

In 1946, emergences occurred on June 1st, 2nd, 3rd, and 28th; July 30, and August 6th. These latter dates give some evidence that late summer butterflies may be from pupae only one month or over 12-months old.

THOMAS W. JEFFERSON (242).

COLEOPTERA COLLECTING IN SOUTH AFRICA

(Continued from p. 22)

Of the *Chrysomelidae*, practically all the sub-divisions occur, a number of species of *Hispinæ* and *Cassidinae* being fairly common. The curious *Sagrinae*, with their brightly-coloured elytra and thickened hind femora, occur only in the northern part of the Natal coast.

The *Cerambycidae* are very diverse and a few species (*Macrotoma*) are very large. The Barker collection in the Durban Museum contains about 330 species, some of which are unnamed and are not represented in the collections at the British Museum. Many species appear to be extremely local and I have some in my collection which are single examples only seen once during five seasons' collecting.

Curculionidae were so abundant that no attempt was made to collect the smaller species. Some of the species from Northern Zululand are very large and hard to kill, even in cyanide. In the collection they stay almost permanently in a relaxed condition.

Three or four species of *Brenthidae* were taken under bark and often in company with small very brightly-coloured *Histeridae*. Examples of the latter family were common in excrement and one or two species of the genus *Hister* are as large as the British *Geotrupes*.

Lucanidae are poorly represented and decidedly rare. One species of *Dorcus* was occasionally met with in rotting timber and a very small species of the genus *Oönotus* was taken twice.

Nearly one half of the beetles collected while in S. Africa were *Scaraboidae*. *Onthophagus*, *Aphodius*, *Copris*, *Sisyphus*, *Onitus*, *Catharsius*, *Helicopris* and other coprophagous genera are abundant and provide an almost unending study for the coleopterist. Many species are very local and are confined to particular types of excrement such as that produced by monkey and bush buck. Others were found only in native excrement and the extraordinary genus *Coptorhina* was met with exclusively in fungi growing on the ground.

Similarly the *Melolonthinae* are represented by many species and Dynastids came to light although we rarely found them in their natural habitat. Some species of day-flying *Melolonthinae* were taken in the Drakensberg Mountains and specimens of the genus *Psilonychus* have been placed in the British Museum. Much work remains to be done in South Africa on this interesting group.

The *Cetoniinae* are represented in the Barker collection at Durban by about 170 species and we were able

to record nearly half this number, mainly feeding at flowers and flowering trees. Bait traps consisting of muslin bags filled with rotten bananas and beer were used successfully. They were hung on trees and in many cases proved the only means of enticing the beetles down from the tree tops. Some of the larger *Cetoniinae* common in the Durban area 40 years ago are now very rare. About twelve species of the genus *Oxythrea* were taken and often flowering trees were literally swarming with these beautiful little beetles.

The *Rutelinae* and *Hopliinae*, though well represented in Natal, are more numerous in the Cape Peninsula. One sunny morning on the slopes of Table Mountain I took a score or so of different species of *Hopliinae*. In addition, representatives of many other families were taken during our five years' collecting but these families were not studied in enough detail to enable me to make useful comment.

We intentionally refrained from specialising in one particular group or family, because we valued the education afforded by general collecting and wished to become experienced field workers conversant with the habitats of as many groups as possible. In this we feel that we have had considerable success. On the other hand, very specialised work on the lesser known families is badly needed, as little such work appears ever to have been done in South Africa.

L. S. WHICHER (1945).

HINTS FOR JUNIOR MEMBERS

(Continued from p. 19)

Glassbottomed collecting boxes should be given a coat of clear varnish once a year. This, applied on the outside of the box only, makes them last indefinitely, apart from actual breakages.

The glass tops of drawers and boxes can be cleaned successfully with a little methylated spirit. Polish at once with a little soft material, and, of course, do not use near a fire or exposed light.

G. C. HOLROYD (253).

When beating for larvae at this time of the year do not forget to keep an eye open for the cannibalistic Dunbar (*C. trapezina*) caterpillar in your

beating tray. The Satellite (*Eupsilia transversa*) larva is another cannibal, nearly as bad as the Dunbar. Orange Tip larvae are also fond of their brethren. So be careful.

T. T.

REARING THE MARSH FRITILLARY

How many of us expect to find the Marsh Fritillary (*Euphydryas aurinia*) in marshy ground, or some such locality? I know I did, but after finding them on chalk hills, on the borders of woods and in clearings in large woods, the only really good guide is the presence of a plentiful supply of their food-plant, the Devil's Bit Scabious (*Succisa pratensis*).

A good patch of scabious provided my first larvae—about a dozen in a spot near Wellingborough. They suddenly appeared, possibly from a wandering female, or a local release, and have not been found since. The females oviposit in one favoured spot each season, as though there were some particular attraction. One such spot, where webs of larvae occur year after year, a few feet from previous webs, is rather sheltered, has a gentle slope, gets all the sunshine and has an abundance of the food-plant.

Females will oviposit on potted Devil's Bit Scabious placed in full sunshine, with frequent showers from a watering-can. Don't water if the female is noticed to be laying! In the wild, egg batches can be found on the underside of the leaves. These should be cut off and pinned to the potted food-plant.

Larvae. The plant can be unsleeved, when thought suitable, and the small larvae left fully exposed through the winter.

The collecting of wild larvae, however small, has been proved a waste of time in most localities, unless the family's parasites only are desired.

Throughout the rearing of *aurinia* the most important thing is warmth and sunshine. The eggs hatch at the end of June or early July. The young caterpillars, after feeding up for some weeks, congregate about the end of August for hibernation. About the end of January or the beginning of February the larvae wake up and spend much time sunning themselves, spinning a web, and eating the old leaves as well as the centre of the plant. Three sleeves of good

big bunches of honeysuckle are now used, tied at the bottom round the foodplants and stuck into 2-lb. jam jars. A slit is left in the top of the sleeve and fastened with a safety-pin. This is for putting in any larvae found after changing. Use a spoon to pick up the larvae; they curl up when touched, if healthy. When changing the food-plant, grade the larvae by size—the largest in one sleeve and so on. This will save a lot of time and disturbance when they are getting near pupation. Keep indoors, if possible, in sunshine; and keep absolutely clean. Just one batch of ova can prove a real handful.

Pupae. Leave just as they pupate; arranging or moving them will only result in cripples. Warmth and sunshine (or electric fire and light used carefully) will induce emergence.

Imago. I use ammonia, carefully, for killing. After killing, place in a pillbox, in a cool place, until ready to set. They will then harden and lose some tendency to bleed when setting. Release all surplus imagines in a suitable place.

Variation. Much variation can be found of interest in one web, so, if convenient, keep each web separately.

Any further information will be given freely on request.

J. H. PAYNE (353).

10 Ranelagh Road,
Wellingborough.

(This article should be read in conjunction with the note by S. G. Castle Russell (119) in Bull. No. 85, p. 116.—Ed.)

REVIEW

The Caterpillars of British Moths, including the Eggs, Chrysalids and Food-plants. By W. J. Stokoe and G. H. T. Stovin, M.R.C.S., L.R.C.P., D.A. In two volumes, with 1488 illustrations of which 441 are in full colour from water-colour drawings by J. C. Dollman, R.W.S. (Published by Frederick Warne and Co. Ltd., London and New York; price 15/- per volume.)

The need for a book on the larvae of the "British Moths" has been a crying need for many years, and a great many lepidopterists have been looking forward to the publication of the present volumes; for, even if supplies would go round, Buckler and kindred works are beyond the purse

of most collectors and the younger students of the larvae. Messrs Warne have now filled this need in some degree.

A very serious omission throughout is the absence of naming authorities; an important point in these days of entomological exactitude. The text matter is generally excellent, although the old fault of giving falsely restricted ranges of distribution is here repeated and I note that that other "whiskery" remark, "It is said," occurs in several places. Hearsay from uncertain and unauthoritative sources is not very helpful.

The black and white plates are first class, although I feel that one good enlargement of each species of egg would have given more detail than the photographs depicted.

The artist is to be congratulated on his excellent water colours but I feel quite confident he did not use the greens as reproduced in some of the plates. The printers have not done justice to his efforts.

I am dividing the coloured plates into three sections as follows:—

- (1) Very good indeed.
- (2) The species recognisable, if you knew it beforehand.
- (3) Those where you can compare a living specimen with the plate and take your choice of several.

Fortunately the first section predominates and usually, where the illustration fails to please, it is due to shrinkage of the paper during printing, so causing faulty registration of the colours. This causes much of the blurring.

Generally speaking, these volumes are first-class if far from complete, and I have no hesitation in recommending them to the collector who wishes to make closer acquaintance with the larvae.

Messrs Warne would, however, do well to endeavour to improve on the coloured plates in any future editions, and not allow them to deteriorate to such an extent as they have done in the companion volumes of South's *British Moths*.

H. E. HAMMOND (423).

NOTES AND OBSERVATIONS

P. H. HOLLOWAY (429) records the first appearance of the Engrailed

(*Ectropis bistortata*) at Fair Oak, Eastleigh, Hants, on 19th February 1949. It was resting on the trunk of a silver birch tree. This is his earliest record of the species. Also, on the same day, he found the season's first male Dotted Border (*E. marginaria*) on an oak trunk.

FIELD MEETINGS 1949

July 16th—Ashworth Valley, Lancs.
Meet Kay Gardens Bus Station, Bury, at 10.30 a.m. (No. 19 Bus).
Afternoon Party to "Simpson Clough," 2.10 p.m. from Kay Gardens Bus Station (No. 19 Bus).

Leader: N. M. Bailey, F.R.E.S., Hill Crest, Limefield, Bury, Lancs.

July 17th—Hatfield Forest, Essex.
Meet "Falcon," Bishops Stortford, 11.15 a.m.

Leader: Epping Forest Group, AES, 1 West Ham Lane, London, E.15.

July 24th—Hackhurst Down, Surrey
(for *corydon*, etc.). Meet Booking Hall, Guildford Station, 10.50 a.m.

Leader: G. C. Holroyd, 8 Elmside, Guildford.

Sept. 4th—Farningham, Kent. Meet "The Bull," Farningham, at 11.15 a.m. Bus No. 21. Green Line 708.

Leader: K. H. Bobe, 19 Hengist Road, Lee, London S.E.12.

AES PUBLICATIONS

LABEL LIST (3/6) and Check List (1/6) of British Lepidoptera (together 4/3). Label List of British Butterflies (4d). The Hymenopterist's Handbook (7/10). [To non-members, 10/10]. Experiments with Bees (AES Leaflet No. 10, recently published), 7d each; 5/- per dozen.

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VOL. 8

No. 102

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**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

EDITED by TREVOR TROUGHT, M.A., F.R.E.S.



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AES



No.

102

BULLETIN

JUNE 1949

EDITORIAL

Members will see from the Notice on page 44 that changes of address should now be sent to Mr B. J. Byerley (788). Mr J. Cowley (771), who has maintained the card index of addresses so accurately for so long finds himself unable to continue to do this on account of the pressure of other work. Mr Cowley was also responsible for the Geographical Key in which members were grouped by counties and by their nearest city, borough, urban district or market town. This was most useful. Our grateful thanks go to Mr Cowley for his most efficient work—and it has, indeed, been work—on behalf of the Society.

We would also thank Mr Byerley, who has kindly volunteered to take over this work, in the sure confidence that he will keep up the high standard.

* * *

We welcome a contribution to this issue from Lt. Col. C. H. STOCKLEY, the noted big-game shot, author and entomologist. Lt. Col. Stockley has done much collecting in India and East Africa for the South Kensington Natural History Museum and has recently published a book called "African Camera Hunts."

Some members have written to the Editor saying that "personal experiences" of members would make interesting reading for other members. We heartily agree, and Lt. Col. Stockley's article exemplifies, although he is not (yet) a member, exactly the kind of article which would be most acceptable—accurate personal observations of interesting or unusual facts, entertainingly written.

* * *

If sufficient members of the AES were willing to make up a party for a course at one of the Field Centres of the Council for the Promotion of Field Studies, the Director of the Council would be willing to make special arrangements for such an AES group. Members will recollect that the AES is affiliated to the Coun-

cil and a course such as this at one of the centres would provide an opportunity for both beginners and more advanced entomologists to meet, exchange ideas and further the objects of both our Societies. It is, maybe, a little late for a course to be arranged for this year, but if such a course is arranged for 1950, would members who are attracted by the idea write in the first place to the Editor, giving the centre and the approximate dates they would prefer. The Wardens like accommodation to be booked from Saturday to Saturday.

THE GOLDEN PLUSIA

The earliest known capture of *Plusia moneta* in Britain was in 1857, when two specimens were taken in Kent (*Ent. Record*, 4: 228), but these remained unidentified and unrecorded until 1893. The species first became established in 1890, when its arrival was made known by the capture of a specimen by a schoolboy at Dover on June 28th. Other specimens were taken in the southern counties during the next few days. In the course of the next nineteen years it spread over nearly all of the south of England as far as Cheshire and Lincolnshire. Devon and Cornwall were exceptions and I have no definite records from the Isle of Wight. It reached Totnes, Devon, in 1923, but Cornwall has not yet been graced by its presence. South Wales was reached in 1906 and N. Wales in 1919, but no one has yet reported it from Anglesey, although it was noted in the Isle of Man in 1927. Specimens were taken at Arnside, Westmorland, in 1909, Hart, Co. Durham, in 1919, and Hexham, Northumberland, in 1924, in which county the insect had become widely distributed by 1938. Glasgow was reached in 1934 and Dalwhinnie, Invernessshire, in 1936. Ireland, like Cornwall, is still out in the cold.

The caterpillar normally feeds on *Delphinium* and *Aconitum* (Monkshood), but T. Bainbrigge Fletcher has reared the moth on *Artemisia*, on which it feeds on the Continent. Our

pet robins ignored the full-grown larvae, even when their attention was drawn to them, but as soon as the caterpillars moved they were snapped up without hesitation. The shuttle-shaped cocoons are normally spun on the lowest leaves of the foodplant and are at first pure white, but become bright canary yellow under the influence of moisture, thus matching exactly the leaves of the *Delphinium* and Monkshood which have by then turned yellow. This protective colouration does not avail them against the eagle eyes of the Great Tit, for I once watched one of these birds hopping about on the ground amongst the stems of the plants tearing open each cocoon it came across and extracting the pupa.

In a forward season there may be two broods, the second being in September, but as a rule the larvae feed slowly and hibernate at the roots of the foodplant, in the old hollow stems, whence they issue the next spring as the plants develop—March 26th is my earliest date, but some individuals emerge a full month or six weeks after the first. I have also found the tiny nearly black larvae feeding on the ripe seeds in the pods in the autumn (*Ent.*, 45: 206). The moth comes to the flowers of *Delphinium*, Pinks, Sweet Williams and most of the other flowers beloved of the *Plusia* group, and as it flies at early dusk it is easily seen and captured. The specimen is best obtained, however, by collecting the spun-up leaves and buds in April and sleeving the larvae on one of the foodplants.

The late CHARLES NICHOLSON
(of Truro).

MITES ON BUTTERFLIES

A. P. Major's (1117*) query on the above, in *Bulletin* 99, p. 14, was referred to Dr A. A. D. La Touche (884), AES adviser on the *Arachnida* (Spiders). Dr La Touche asked the opinion of the Rev. Dr J. E. Hull, who has been interested in mites for many years, who said, "So far as I know, no red mites have been known to attack living insects in a breeding cage nor anywhere else; and the species that feed in 'swarms' are limited to the Empodine section of *Thrombidiidae*—which are vegetarian.

Certain Empodine species abound in the orchards of Kent and I should suggest that a party had invaded your correspondent's breeding cage or per-

haps had been introduced as 'eggs' on twigs at some time or other."

Dr Hull asked the opinion of Prof. J. W. H. Harrison, who said that he had not seen red mites on lepidopterous pupae or imagines, but had seen brownish mites, which he had set down as immature Gamasids, on dead lepidopterous pupae. He suggested that the term "red" might have been used a little loosely; also that the mites might have come from cracks in the cages. He had had an opportunity of examining very many wild pupae of the Small Tortoiseshell and the Peacock, in 1948, on the Isle of Rhum; pupae of these two species occurred there in thousands, but none carried a single mite.

(We are greatly indebted to Dr J. E. Hull and Professor J. W. H. Harrison for the interest they have taken in this problem.—Ed.)

My experience of the red mites referred to by A. P. Major (1117*) has been that they are most frequently encountered amongst the *Satyridae*. About 50% of a series of Marbled Whites (*Melanargia galathea*) which I took near Corsham, Wilts., in August 1947, were infested with them. An even higher proportion of the Scotch Argus (*Erebia aethiops*) which I examined at Kandersteg, Switzerland, on the 5th August 1947 were also suffering from these mites.

The mites apparently merely cling to the body of the butterfly and do not burrow beneath the skin because I found that if all visible mites are removed with a pin before setting, the specimens suffered no subsequent damage.

K. A. SPENCER (1563).

CATERPILLARS DEPRIVED OF THEIR NORMAL FOODPLANT

Certain caterpillars will feed readily enough on plants bearing no resemblance to their normal foodplant. In some instances this does them no apparent harm, in others they ultimately die, fail to pupate, or the imagines fail to emerge.

Professor Balfour-Browne in a recent lecture to the South London Entomological Society mentioned that in some cases the caterpillars of the Lackey (*Malacosoma neustria*), fed on laurel, fail to produce the perfect insects.

My own experience of this is limited to the Spurge Hawk (*Celerio*

euphorbiae). Early in June 1948 I collected three larvae feeding on Spurge at Kavalla, Greece. On returning to my base at Kilis I was unable to produce any spurge for five days. During this time one of the three larvae fed quite happily on a garden weed resembling chickweed, the other two preferred to starve. When, after five days I obtained a further supply of spurge, all three larvae continued feeding for a week and then burrowed underground for pupation. However, the one which for five days had lived on a strange diet died while attempting to pupate. This may have been a coincidence, but it seems more likely that it poisoned itself on something that it nevertheless found completely palatable.

I should be interested if members could provide further information on this question.

K. A. SPENCER (1563).

A NATURAL HYBRID "BLUE"?

I am inclined to agree with certain points in Mr P. Siviter Smith's criticism of Mr B. O. C. Gardiner's recent review of *Butterfly Miracles and Mysteries* by Bernard Acworth (*Bull.* 95, p. 228, and *Bull.* 99, p. 18).

In his reply to the criticism, Mr Gardiner is apparently under the impression that "a male Chalkhill Blue has never been seen *in cop.* with a female Adonis Blue or *vice versa*."

It is accepted by many entomologists that the variety *polonus* Zell. is a natural hybrid between *Lysandra corydon* Poda and *L. bellargus* Rott. The evidence for such a conclusion, though circumstantial, is, according to Dr E. B. Ford (*Butterflies*, pp. 230-231):—

(1) *Polonus* only occurs where both species fly together, and in these localities individuals of one species have been found *in copula* with individuals of the other (this is not, of course, conclusive proof that offspring are produced as a result).

(2) *Polonus* generally emerges early in July, i.e., between the times of appearance of the supposed parent species.

(3) One form of the *polonus* male (which is dimorphic) is approximately intermediate in appearance between *L. corydon* and *L. bellargus*, the forewings more resembling those of the latter species, while the hindwings are similar to those of the former.

(4) The second form of the *polonus* male does not resemble any other British "Blue," being of a peculiar dull colour, with a strong violet sheen on the upperside. The underside markings are, however, more or less intermediate between those of *L. corydon* and *L. bellargus*. (In a species-cross a character unlike those of either parent frequently appears in the offspring.)

A few *polonus* females occur, but they are difficult to identify and probably tend to be overlooked, as the females of the supposed parents are so much alike.

It might be extremely interesting to attempt breeding from a *polonus* female by crossing it with a male *L. corydon* or a *polonus* male, or even a male *L. bellargus*, since the text books do not seem to make clear of which of these two species *polonus* is a variety.

In the *Lepidoptera* if one sex is sterile it is always the female, i.e., that having the unlike pair of chromosomes. If, therefore, successful breeding can be accomplished from a *polonus* female then Captain Acworth's theories may well do more than amuse us. We have no conclusive evidence that *L. corydon* and *L. bellargus* are not two races of the same species, perhaps similar to *Aricia a. agestis*, Schiff. and *A. a. artaxerxes* F., while the North of England hybrid race (*agestis* × *artaxerxes*), where these two sub-species meet, might well be comparable to *polonus*.

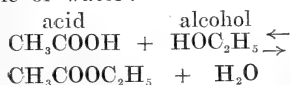
If any member has any experience of *polonus* (particularly breeding experience) I would be very interested to hear from them.

T. PARSONS (1513).

SUBSTANCES FOR KILLING INSECTS

(Continued from p. 17)

(7) **Ethyl Acetate** (when asking for it, pronounce it "eethile") also called *Acetic ester* (but not acetic ether, there is no such thing). $\text{CH}_3\text{COOC}_2\text{H}_5$, B.P. 77°C . (171°F .) is a colourless, mobile liquid having a pleasant, fruity odour. It is somewhat inflammable, is non-poisonous, and nearly insoluble in water. It is a compound formed from acetic acid and common alcohol by the loss of one molecule of water:



The arrows show the action is reversible. Acetic acid may be reformed, spoiling many specimens.

These esters, formed from organic acids and alcohols, are the substances giving to fruits their particular odours: e.g., amyl acetate—pears, amyl valerianate—apples, ethyl butyrate—pineapple, etc. [For a list of recipes for fruit essences, see *The Pharmaceutical Journal*, 17th May 1879.]

I have used ethyl acetate for killing Lepidoptera but have discarded it, as it is not superior to chloroform in its advantages and has two serious disadvantages:—(1) Unless great care is taken to use very little in the killing bottle, the vapour easily condenses on the side and bottom of the bottle, which spoils many specimens; (2) many Lepidoptera, when apparently dead, will recover after being some hours on the setting board.

Other entomologists, however, are using it with success for killing *Hymenoptera*, *Diptera*, *Trichoptera*, *Odonata*, etc. Amongst a number of letters from AES members, one from J. Cowley (771) details a method of use, which he finds successful with some of these insects, by placing a suitably-sized piece of rubber sponge in the bottom of the killing bottle or tube and allowing it to absorb a sufficient quantity of the liquid. Advantages:—Rapid action, rigor soon passes and specimens remain relaxed in the bottle. Disadvantages:—As above. The ethyl acetate should be pure and fairly fresh when used.

H. HENSTOCK (209).

W. G. TREMEWAN (940) points out that sodium cyanide is just as good as potassium cyanide as a killing agent and is used in the same manner.

ENGLISH BUTTERFLIES IN FAR COUNTRIES

By Lt. Col. C. H. STOCKLEY.

Coming across English butterflies in other countries is like meeting old friends unexpectedly in strange places. The Himalayas are the most profitable grounds for such meetings, and once one gets above 6000 feet there is hardly a place or a day which does not produce some species formerly seen on a hot summer's day in England. Near the top of the treeline, at about 10,000 feet, is the most prolific altitude, for nearly all our common *Vanessas* are to be found on any

sunny slope, including Large and Small Tortoiseshells, the Comma and the Painted Lady; though the last is an almost universal butterfly, found from sea-level to 12,000 feet or more both in Asia and Africa, wherever there is sun and open country.

The Clouded Yellow will also be there, and is almost as widely distributed, both the common and the pale forms, and both are common here in my Kenya garden.

Then our Swallowtail, *Papilio machaon*, is plentiful high up on the slopes bordering the great Tibetan plateau, though it does not come down to the plains of Southern Asia, and is not found near forest. In Kashmir, on coming down from the higher hills in September, I have found the warm glades at the foot of the pine forests full of two of our big fritillaries, the High Brown and the Dark Green, while the lovely Queen of Spain fritillary is common on the hills on either side of the Gilgit road at 10,000 feet and over. At about the same height one finds the Bath White, with the Green-Veined, Large and Small Cabbage Whites swarming in the upper Indus valley and the slopes around it.

On the plains of India, in addition to the Painted Lady and Clouded Yellow, the only other butterfly on the British list is the Milkweed or Monarch (*Danaus plexippus*), which is a very rare visitor to England, and probably brought over in loads of fruit.

The Tailed Blue (*Lampides boeticus*) is the only one of the British Lycaenids found in Asia (and is also plentiful in the highlands of East Africa), except for a very rare catch, the little Green Hairstreak (*C. rubi*) which I took on one trip in the remoter parts of the Baluchistan frontier. It was on another trip in this very wild country that I made the most remarkable catch of my experience. I was up on a ridge with an escort of forty rifles, spending a couple of days at a tiny outpost, when there came a heavy shower about mid-day, leaving a puddle beside which I was having my tea at four o'clock. Down swept a red and black butterfly, alighted and began drinking on the sunlit mud. I hardly looked at it at first, then suddenly realised that it was not a *Vanessa indica* beside me as I had thought at first, but a Red Admiral, our own English garden lover. I had no net,

and in rising to get one I startled it and it flew away. Knowing how butterflies are given to visiting the same places at the same time of day, next afternoon I was there net in hand at four o'clock, down came the Red Admiral to settle on the mud, and inside a minute was in my net. It is now in the British Museum, the only specimen of the species ever taken in India, and not less than a thousand miles east of the nearest record.

WHAT WAS IT?

Walking down a Cornish lane one June evening, I noticed an abundance of small white disc-like snails (*Helix*) scattered over the leaves of the bramble. One a few millimetres thicker than the rest caught my eye and on closer scrutiny I found that it was a white caterpillar, curled tightly upon itself through 360 plus 90 degrees of arc. This was so singular and so successful an instance of mimicry that I boxed it and fed it. On shedding its skin, it emerged an ordinary larval green; but within a few hours it had secreted a waxy white powder which again made it closely resemble a slightly larger snail. I never saw it in motion and it spent all the daylight hours resting coiled up on the upper centre of a leaf. In packing up to return to London at the end of my holiday, I was clumsy enough to let it roll out of a window into dense shrubbery and had no time to find it again. Subsequent search of books on British Lepidoptera and insect mimicry has not revealed any reference to caterpillars counterfeiting snails. Can any member tell me what it was?

W. J. B. CROUCH (1181).

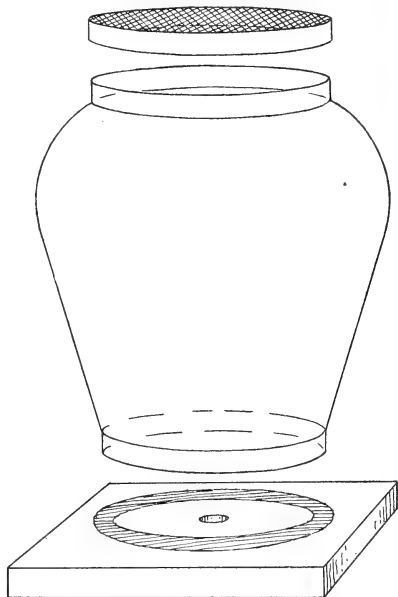
ANOTHER TYPE OF LARVA CAGE

I regret I am unable to subscribe to the views expressed by Miss Hopkins on rearing young larvae, in *Bull.* 99, p. 15.

The sketch is definitely misleading, as the bag would require support; again, many plants do not lend themselves to being potted up, quite apart from having to give as much attention to the plant as to the occupants of the sleeve.

My own method evolved after 50 years' experience of rearing larvae is, I venture to suggest, not only superior, but by reason of its much wider application, more valuable.

Briefly, then, a 4" square of wood has a central hole of say $\frac{3}{8}$ " drilled, and a "washer" of lint glued or tacked thereon, on which the small end of a hurricane lamp glass rests concentrically, while the top is covered by a piece of muslin held by a rubber band—or preferably by a specially made cap, referred to later.



Food plant is pushed through the hole, and the board placed on a jar of water. Plants will often keep fresh for a week or more.

Not only are the larvae visible, but the state of the foodplant can also be seen.

To clean, lift board and glass together and place on its side, when the bulk of the frass will fall down; now let it rest upside down and remove the board with the old foodplant, tapping the foodplant to shake the larvae into the glass.

Clean the board and insert fresh food in the hole; ease the foodplant into the still inverted glass, and replace the lot on the jar.

The muslin cap can now be removed and all the larvae remaining on the old foodplant can be collected up and put in the glass and the cap replaced.

I much prefer to make a cap for the glass as a rubber band is fraught with risks to the larvae on removal.

To make the cap I take a strip of high-grade ivory board, long enough to fit exactly round the rim of the glass, and wide enough to sit on the shoulder while riding proud of the rim.

Tie it *in situ* with two or three rounds of cotton; glue it and place circle of muslin over the top, extending over the strip; glue the muslin covered strip again and place another strip of board round it, keeping it in place with a few more rounds of cotton.

When dry, remove the cap, trim it and you have a cover which will last you a lifetime, which is a dead fit and absolutely prevents the escape of the smallest larva.

This cage is quite the most successful I have ever used, and gives least trouble; you can rear small geometers that spin up, from ovum to pupa in it; even odd large larvae are happy in it, and last, but not least, it is useful for hibernating larvae. I have at the present time (March 1949) batches of *caja* and *gonostigma* alive and healthy.

L. G. F. WADDINGTON (169).

THE ECCENTRIC SMALL EGGAR

It is 8 p.m. on February 7th, 1949, and, as I sit by the fire, I am taken back to a June day of nearly three years ago, when, in a Suffolk lane, I found the larva of a small pale brown moth which at the moment clings to a bare twig that he has just ascended, there to expand his wings. But I would start the story at the beginning.

On June 7th, 1946, I was on holiday at Southwold, on the Suffolk coast, having chosen this time of the year in order to take certain species, amongst them being *Eriogaster lanestris*, the Small Eggar, a common moth perhaps to Southerners but unobtainable in my home district. The acquaintance of Mr Geo. Baker, a very good friend and entomologist, was again made after an unavoidable interval of some six years. We talked of "localities" as bug collectors do and on my enquiring as to the whereabouts of *E. lanestris* he called to mind that a certain gentleman who lived in such-and-such a road had remarked on observing the larvae of this moth at a place some 15 miles away. It was now about 11.30 p.m., but we must needs go and knock him up. He came to the door in his dressing gown, but we

nevertheless received a cordial welcome, and on going straight to the point I was lent a one-inch ordnance map with X marking the spot where he had seen the larvae crossing the road some three years previously.

The next day found us at the certain bend in the road marked on the map. I pulled into a gateway and on stepping out of the car was not so surprised to find *E. lanestris* within a foot of the running board. Further closer investigations revealed as many of its companions on a nearby elm hedge as one might wish to collect.

So that is the origin of the moth to which I originally referred. The larvae, by the way, are sun-loving creatures and I find that they do best if kept out of doors in a cage facing South.

I brought the cocoons into the warm kitchen in early February 1947, and emergences were as follows:—

2	.....	March	5th,	1947.
10	.....	"	9th,	"
4	.....	"	12th,	"
1	.....	"	15th,	"
1	.....	"	16th,	"
1	.....	"	18th,	"

This represented about one-third of the brood and all emerged between noon and 1.30 p.m.

1948 saw only a single female, on February 15th, at 7.45 p.m.

1949 to date has coaxed out the following:—

1	.....	February	7th.
4	.....	"	11th.
1	.....	"	20th.

And so, I suppose, it will go on for seven years. What is it that delays their emergence into the outer world? If you open one up it will be found to be fully formed within the pupa case and able to expand its wings in the normal way.

E. RAMSDEN (130).

A SIMPLE AND EFFECTIVE WAY OF PRESERVING SET INSECTS

Take an ounce of industrial spirit; preferably ether. Dissolve in it about $\frac{1}{2}$ gramme of corrosive sublimate of mercury. Completely immerse the set insect in the solution for a few seconds, then remove it and touch its wing tips, etc., with blotting paper to remove excess spirit; the insect can then be set in a draught to dry.

No mites, mould or mildew will attack the insect, and the treatment

also helps to preserve the colours. I can recommend this method as being both efficient and practical. I have used it myself and have seen insects which have been preserved by it up to thirty years—they look as fresh as newly-set insects.

D. H. SHIELD (1157).

(*Corrosive sublimate is a deadly poison and ether, of course, very inflammable. A similar method is largely used in the preservation of botanical herbarium specimens.—Ed.*)

SOME JUNE BUTTERFLIES

The collector who plans well should arrange his expeditions so as not to overlook the young stages of those species which are not flying, as many of these are little known.

Take, for example, the Blues. The Common Blue (*Polyommatus icarus*) is to be found about the middle of the month (in the South) feeding on the leaves of Bird's-foot Trefoil (*Lotus corniculatus*), eating into the substance of the leaf from either the upper or the underside, leaving the opposite skin as a white spot; sometimes they eat the flowers, including the petals.

Similarly, on the chalk, caterpillars of the Chalk-Hill Blue (*Lysandra coridon*) are to be found on the same foodplant, as well as on Kidney-vetch (*Anthyllis*) and Horseshoe-vetch (*Hippocrepis*). For those who have no sunny oviposition cage, it is worth following a female Adonis Blue (*Lysandra bellargus*) when she is laying and picking the leaves one after the other as she quits the plants on which she has been engaged.

The circular, flattened, greenish-drab eggs of the Brown Argus (*Aricia agestis*) are laid in June in little groups of two, three or more, on the underside of the leaves of Rockrose (*Helianthemum vulgare*). Later in the month, and in July, the larvae can be found on the undersides of the leaves. The younger larvae make small pale spots on the upper dark green surface of the leaves, the spots becoming larger and browner until, at last, almost the whole undersurface of the leaves is entirely eaten. With an indefinite supply of food, they rarely remain long enough on one leaf to do more than blotch it markedly before moving to another.

Although the eggs of the Small Blue (*Cupido minimus*) are placed low down on the calyces of *Anthyllis*

flowers, and thus hidden from casual observation, they may easily be detected by careful search. Fertile females of this butterfly, enclosed over these plants and allowed plenty of sun, will lay eggs freely among the flowers.

The adults of this butterfly, when one knows where to go for them, may sometimes be found sitting in rows of half-a-dozen or more on the grass stems on the outskirts of a chalkland wood, or other sheltered spot; in the afternoon they are also occasionally found, after a dry spell, sitting in numbers at puddles, in the hot sun. [But even if such large numbers are met with, we do request members NOT to take too many, for rearing or any other purpose, as there are cases on record of this butterfly having been cleared out by this means of habitats where it was once common.—Ed.]

At the end of June, and in July, caterpillars of the Green Hairstreak (*Callophrys rubi*) may be searched for or beaten from the various food-plants of this somewhat local, though widespread, butterfly. These include rockrose, bilberry, broom, gorse, bird's-foot trefoil, *Genista*, bramble and dogwood (*Cornus sanguinea*).

The larvae of the Brown Hairstreak (*Thecla betulae*) always sit on the underside of a leaf of sloe along the midrib, and are most difficult to see. But they are not difficult to heat in their southern haunts; for this an umbrella is preferable to a beating tray, as it can be fitted more easily into the structural irregularities of the blackthorn bushes. Stunted bushes are often the most prolific heating sites.

The low branches of oak, with thin growth of foliage, on isolated trees, will often prove best for larvae of the Purple Hairstreak (*Thecla quercus*). Search the tray carefully, as the half-grown caterpillars exactly resemble the fallen bud-sheaths in colour. Similarly the larvae of the White-Letter Hairstreak (*Strymonidia w-album*) may be beaten from low elms, on the outskirts of woods.

Towards the end of the month carefully search the seed-pods of cuckoo-flower (*Cardamine*) and garden rocket for larvae of the Orange Tip (*Euchloë cardamines*). Examine those where the growth of the seed-pod seems irregular, usually due to the feeding of the caterpillars, which rest closely against the stem or a pod,

and are not easy to recognise at first. The larvae of the Green-veined White (*Pieris napi*) may sometimes be found in numbers on such cruciferous plants as watercress and *Sisymbrium* (Hedge Mustard).

Towards the end of the month, larvae of the Brimstone Butterfly (*Gonepteryx rhamni*) are to be found on buckthorn bushes; stunted bushes in sheltered nooks on the outskirts of woods are especially good spots for them. The caterpillars so exactly resemble the midrib of the leaf (along which they rest) that many will escape notice unless the collector places himself so that the sunlight falls across the leaf, when the shadowed side of the larva reveals its position.

The larvae of the Painted Lady (*Vanessa cardui*), in an immigration year, are most abundant in their little globular homes of spun-together thistle leaves in late June and early July.

The gregarious larvae of the Peacock Butterfly (*Nymphalis io*) as well as those of the commoner Small Tortoiseshell (*Aglais urticae*) are to be found in good-sized companies, in late June and early July, often earlier, spread out over beds of stinging nettle by roadsides, in ditches and waste-places, behind hedges, and in sunny corners on the edges of woods.

After J. W. TUTT.

Extracted by J. A. DALE (1206*).

ESSAY COMPETITION FOR JUNIORS, 1949

The AES Council is offering an annual prize of *one guinea* for the best essay written by a **Junior Member**, on a subject chosen by the Council.

The Essay should not be less than 600 nor more than 800 words in length. The author must give his age, as this is considered in the judging. Other points which should be borne in mind are:—

The arousing of interest in the reader.

Technical data must be correct.
A good style is valuable.

The **Subject** for 1949 is: "**The Group of Insects I like best, and Why.**"

Entries must be sent to the Youth Secretary, 31 Pinner View, Harrow, Mddx., before 31st December 1949.

The Council have the right to award further prizes at their discretion, if the entries justify this.

ESSAY COMPETITION, 1948

The response to the Essay Competition, "My Best Day in the Field," was regrettably apathetic, and there was little choice to be made.

RICHARD LUDLAM (1519*) deserves his prize of one guinea, but it is hoped that more will enter for the 1949 competition, and that there will be keener competition.

DIRECTORY OF NATURAL HISTORY SOCIETIES

The compilation of the *Directory of Natural History Societies* (Pamphlet No. 7) was authorised by the AES Council in December 1943, and work was begun immediately by Mr W. G. Rawlings (452). Unfortunately, during 1944 he was compelled by ill-health to give up the work, and nothing further was done for a year, when the compiling was carried forward once more by Mr H. K. Airy Shaw (545), Mr L. R. Tesch (1), and Mr B. A. Cooper (19), until its completion and publication in July of last year. The Directory has attracted widespread interest among naturalists, and has received a warm welcome.

Several of the reviewers echo the regrets which Mr Shaw expresses in his introductory note, that so many of the Societies to whom questionnaires were sent failed to return their forms. It is hoped that they will prove more co-operative in future. Sufficient additional details of Societies have already been received to justify the production of a First Supplement this year.

The first number of *The New Naturalist* (journal) included a list of natural history societies abridged from the Directory which, in addition, was given a long review by Mr J. S. L. Gilmour. He pointed out, as Dr Julian Huxley and Mr R. S. R. Fitter do in their foreword, that the Directory is an interesting indication of the immense amount of work of scientific value which has been done by amateur students during the past century and more. Their labours are recorded in the publications of many of the societies—but in the case of too many of the smaller organizations they remain, alas, unpublished and all but inaccessible. Mr Gilmour concludes: "The Amateur Entomologists' Society and the compiler are to be warmly con-

gratulated on their vision in realising the need for such a Directory, and on their courage in tackling it under war-time conditions."

Nature Magazine, of Washington, D.C., U.S.A., under the heading "Nature Society Directory," wrote: "Graphic evidence of the widespread interest in Nature in Great Britain is found in the 156-page booklet entitled 'Directory of Natural History Societies,' published by the Amateur Entomologists' Society. Organizations range all the way from the British Association for the Advancement of Science to, for example, the Beckenham County Grammar School for Girls Field Club. Many schools have active and valuable groups, and amateur naturalists have long made important contributions to biological knowledge in Britain. Any one interested in Nature and planning to visit Britain would be well armed with this booklet."

Zoo Life, published by the London Zoological Society, in a review of fair length by Dr Edward Hindle, said: "This Directory will be invaluable to any naturalist who wishes to study the natural history of any part of the British Isles, and the Amateur Entomologists' Society is to be congratulated on its publication."

Nature related the history of the compiling of the Directory, and added: "The material arranged under each entry in the Directory is sufficient to guide naturalists in a distant county to a group of like-minded individuals. Not the least important parts of the Directory are the particulars of so many school natural history societies."

The Naturalist said: "This useful compilation gives a comprehensive list of all existing, extinct or moribund Natural History and Scientific Societies, from The Royal to the British Snail-Watching and Guppy Breeders' Societies. The Directory should be valuable for anyone wishing to get in touch with local naturalists or societies in any part of Britain and the compiler is to be congratulated on the completion of a work which was first projected by the Amateur Entomologists' Society nearly five years ago."

Then from *School Nature Study*, which gave valuable help with school societies in the early days of compilation: "This is an invaluable reference book which supplies a long-felt

need, and it should be in the possession not only of public libraries and of natural history societies, but also of those individuals who would be greatly helped in their work by ready access to such a directory."

The Microscope said of the Directory: "Certainly its arrangement and usefulness do great credit to all concerned . . . we wish the Directory every success."

The Countryman, in a brief note, declared: "It fulfils a long-felt want."

The Entomologist's Monthly Magazine, after describing the contents of the Directory, continued: "The work will be invaluable to naturalists wishing to know of publications or organizations covering any given area, and we congratulate Mr Airy Shaw and his collaborators on their skill in tracking down so many of the smaller associations, present and past."

The Entomologist's Record began their review: "The Amateur Entomologists' Society has issued a most useful book to all lovers of Nature."

The Book Exchange, a trade journal, described the Directory as "A very useful list of natural history societies in Great Britain and Ireland, giving adequate details of each."

The most recent notice appeared in the March number of *The Aquarist*: "A most commendable effort on the part of the Amateur Entomologists' Society has been the publication of a *Directory of Natural History Societies* in book form. As mentioned in the Introduction to the book (edited by Beowulf A. Cooper), Natural History Societies have been poorly advertised, and the provision of this detailed list will aid those who, finding themselves in a strange district, wish to be introduced to friends with similar interests to their own."

"The *Directory* should be added to all reference libraries, and every naturalist should see that the book is brought to the notice of his local library."

"A suggestion made here to the compilers is that many users of the *Directory* might find a list of all the periodicals connected with Natural History subjects very useful; after all, these are entitled to a mention in the book, representing, as they do, very large numbers of enthusiasts bonded as readers into the largest society of fellow-readership."

It is of interest that the inclusion of a list of Natural History periodicals has already been considered, and it is probable that one will be added to future editions.

Members will see that the production of the Directory was a worthwhile undertaking which has been rewarded by success: it is the publication for which there is by far the greatest demand, and it has large sales to non-members. The AES has good reason to be grateful to all those members who were concerned in its production.

E. LEWIS (952)

(Hon. Publicity Secretary).

EARLY RECORDS

PAUL H. HOLLOWAY (429) reports that a friend brought him a normal male Cinnaber moth (*C. jacobaeae*), which had flown into his office at Hamble, Hants., on the afternoon of March 21st, 1949. Mr Holloway has known it to occur frequently in April, but never before in March.

W. J. B. CROUCH (1181) writes:— On 17th March a neighbour brought me a Buff Tip moth (*P. bucephala*) with which her cat was playing on the carpet. Apart from a lost leg and torn wing, presumably due to the cat, it was in fresh condition, but died within 24 hours. South says the moth flies in June or July. Was this a hibernator or an out-of-season emergence?

CORRIGENDUM

On page 25, *Bulletin* 100, first column, line 4, for "Burton" read "Barton."

IMPORTANT NOTICE

Members' changes of address should now be sent to Mr B. J. BYERLEY, 48 Elmgrove Rd., Harrow, Middlesex.

Notification of a change should be made immediately to avoid unnecessary delay, or even failure, in delivery of the *Bulletin*.

LEONARD WOODS NEWMAN

The passing of Mr Newman will leave a gap in the sphere of British Entomology that will never be filled again. Born a naturalist, his fondness for the path he followed soon attracted the attention of collectors of Lepidoptera, while he was still young, and encouraged by their attention he founded his famous Butterfly Farm at Bexley in Kent.

This proved an immediate success, and has been of immense value to the entomological world by bringing collectors together and by providing the material, facts and figures for workers in many fields.

Mr Newman had a natural flair for breeding insects and there are few British Moths or Butterflies that he did not, at some time or other, rear right through from the egg stage with an ease which has amazed many.

He found out many undiscovered facts in their life cycles and in methods of rearing difficult species, and this information was freely handed to all.

The amazing results brought about by his knowledge and careful breeding can be judged by a comparison with the efforts of others. The Rev. G. H. Raynor will always be remembered for his wonderful *grossulariata*, Mr Head for his *napi*, Mr Sharnan for his *caja*, but a short list of some of the strains which resulted from Mr Newman's work is startling. Early in his career he produced the famous yellow form of *dominula* in large numbers, shortly to be followed by the strain *bimacula*. Shortly after he produced the unequalled series of confluent and partial melanic *paphia* from wild New Forest parents.

Extended over many years came the most extraordinary series and forms of *grossulariata* var. *varleyata* which have ever been produced. He paired *dromedarius* with *ziczac* to achieve var. *newmanii* of Tutt, a feat which has never been repeated.

Then followed about a score of black *machaon* followed by melanic strains of *autumnaria*, *coryli* and many others.

Later in life he bred remarkable series of *c-album*, dark chocolate one year to be followed by a series of pale straw-coloured forms the next.

In more recent years he produced the beautiful form of *callunae* var. *olivacea* and *versicolora* var. *diabolica*, both being dark forms.

The forms mentioned were not merely isolated specimens, but long bred series. Of single specimens of unique form there were legion, both bred and captured in the field.

He was an untiring worker in the field and the most wonderful companion to go collecting with. Who else could guide you to the right places? More could be learnt from a few days in the field with him than was ever written on the same species, and he was a most generous teacher.

Amongst fellow entomologists he had a very, very wide circle of personal friends who will miss him, not only as a master at his craft, but as the man he was.

R. L. E. FORD (527).

Dr A. D. IMMS

We record, with the deepest regret, the death of A. D. Imms, D.Sc., F.R.S., on April 3rd at his home in Sidmouth.

Dr Imms graduated at Birmingham University in 1903 and then proceeded to a B.A. Research degree at Christ's College, Cambridge. After a short time as demonstrator in Zoology at Birmingham University he took up the Professorship of Biology in the University of Allahabad, afterwards becoming Forest Zoologist to the Indian Government. It was whilst in India that Dr Imms first became famous, mainly for his masterly researches on termites.

Returning to England in 1913 he was appointed Reader in Agricultural Entomology in the University of Manchester, and it was here that he commenced his *magnum opus*, "A General Textbook of Entomology," a task that was to occupy him for over ten years. After Manchester, Dr Imms became Chief Entomologist at the Rothamsted Experimental Station, a post he held until he was appointed Reader in Entomology in the University of Cambridge, where he stayed until his retirement in 1946. The present large and flourishing sub-department of Entomology in Cambridge was built up from practically nothing by his untiring efforts and expert knowledge.

Dr Imms had a very profound grasp of the principles of entomology. He was as much at home in the field as in the laboratory. Anyone who has read his most recent book, *Insect Natural History*, will realise this. He could name almost any insect that was presented to him and also give a *resumé* of its life history and habits. We doubt if we shall see his like again.

B. O. C. G.

ASSEMBLING OF OAK EGGAR

I was interested in Mr Peter Michael's (748) article in *Bulletin* 95, and would like to give an incident I experienced some years ago.

A female *L. quercus* emerged in my cage. I put her in a glass-bottomed

collecting box for the night. Next morning I was going to a place ten miles away for some *C. hera* (Jersey Tigers), and, wanting all the large boxes I possessed, I gave the *quercus* her freedom, and took the box in my satchel. Before I began my search for *hera* in a friend's garden, I put my satchel on the lawn. Alas! it began to rain so I went to take it indoors when three males flew out of it, two of which followed me into the house, and refused to leave it. This shows how strong the scent must have been to cause the males to follow an empty close-fitting box, and also shows they didn't need an S.O.S. message from the female, as there was no female there to give the signal.

W. O. W. EDWARDS (570).

A WINGLESS WONDER

In the village square near my home in Fair Oak, Hampshire, I have done some successful collecting during the winter months at the illuminated "Keep Left" signs, these being the only brilliant lights in the neighbourhood of the village. Each winter there is an abundance of *defoliaria*, *pennaria*, *brumata*, *P. populi*, and later *leucophaearia*, *marginalia*, *pedaria* and *strataria*.

On 3rd November 1948 a *Sprawler* (*B. sphinx*) appeared for the first time. The most remarkable appearance, however, was a female *defoliaria* on 8th December on one of these signs, about two feet from the base. This species breeds abundantly in wooded areas approximately two miles from the village, and, in the spring, the oak trees are stripped of foliage by the larvae. About three feet from the light on which this insect appeared there is an oak tree from which the village gets its name, in the centre of the square. I have never observed any defoliation of this solitary oak, so it seems very improbable that breeding takes place in such an exposed situation. How, then, can we account for this unusual appearance? Could it be that the female was aware of the fact that males were frequenting the spot, or was it actually attracted by the light? It hardly seems feasible that the insect walked the long distance from the nearest woods, yet how else it could have appeared I fail to see! I have never before observed a wingless female of any species at light, and very few of the winged kind.

Perhaps other entomologists could advance a theory which would help to solve this mystery of *defoliaria*.

P. H. HOLLOWAY (429).

(This note raises the whole question of how species with wingless females spread. Observations by members bearing on this point would be welcomed. Has anyone actually seen a male and a wingless female flying in cop.?—Ed.)

REVIEWS

Moths and Memories, by P. B. M. Allan. (London, Watkins and Doncaster, 1948, pp. 316; 12/6.)

For the third time we are charmed by a book from the pen of Mr Allan, whose *Moth Hunters' Gossip* and *Talking of Moths* should need no introduction to our readers. This book is on the same lines as its predecessors and is written in the same easy and charming style.

From the first chapter—"Idle Gossip"—we see that Mr Allan is as much at home with a gun as he is with a butterfly net. "Birch and Millers"—the second chapter—discusses the interesting question whether alder is a substitute food for birch. We find Mr Allan's theories both acceptable and easy to follow.

In two further chapters the decline of the Black-Veined White and the rise of the Jersey Tiger are discussed. Just why a species should become extinct, or alternatively, extend its range has always been a debatable point and here we have evidence for these two species clearly stated.

Of the chapter "Ghosts—and Cossus" the reviewer must admit that at one moment he was convulsed with laughter whilst at the next cold shivers went up his spine. But the chapter finishes on a pleasant note and he slept undisturbed.

In "Beer and Skittles" we strike a humorous vein again and are left in little doubt that Mr Allan has as good a knowledge of wines as he has of entomology. We think that this chapter alone is enough to put him in the forefront of humorous writers.

The last chapter, "The Polygonoma Club," is one of the most delightful skits we have read, aimed at those whose chief object is to change the name of some poor innocent insect which has already passed its century

and is still going strong. It is the perfect *reductio ad absurdum* of the genitalic species—taken at the end of the season at Royston.

We feel that this is a book no entomologist should be without. It is well worth missing a night's sugaring to read.

B. O. C. GARDINER (225).

Journal of the Society for British Entomology, Vol. 3, Pt. 2 (pp. 43-119. Published by the Society, March 1949; 12/6).

It is nearly three years since Part 1 of Vol. 3 was published, and Part 2 makes a very welcome addition to the Society's publications. The two longest papers are "Some Diptera from Surrey and the South-West of England" by J. Cowley and "Taxonomic and Distributional Notes on British *Diplazoninae* (Hymenoptera, Ichneumonidae)," by G. J. Kerrich.

Captain Dannreuther, in a series of papers, discusses some of our more rare migrants, including the Bath White, Long-Tailed Blue, the Wainscot moths and the *Heliothinae* (The Bordered Straws, Marbled and Spotted Clovers).

Odonata are catered for in Notes dealing with the distribution of *Ischnura pumilio* and a paper on the breeding status of *Aeschna mixta* and *Sympetrum flaveolum* and *S. fonscolombii*. Other notes in this issue deal with *Orthoptera*, *Coleoptera* and *Lepidoptera*. The Journal will be of interest to the amateur entomologist who is interested in "distribution," for it is mainly with the distribution and occurrence of species of different orders that this issue deals.

B. O. C. GARDINER (225).

The Hymenoptera Aculeata of Bedfordshire, by Dr V. H. Chambers. (Transactions of the Society for British Entomology, Vol. 9, Pt. 4, pp. 197-252, March 1949; 10/-).

Apart from a previous note by the same author, this is the first time a list of Bedfordshire *aculeata* has been prepared. A particularly useful feature is the correlation of the species with the geological strata of the County. Biological data, times of appearance, localities and abundance of all the species is given. An excellent "local list," and many hymenopterists will wish to possess a copy.

B. O. C. GARDINER (225).

WHERE TO WRITE

Articles, drawings, etc., for all AES publications to: **TREVOR TROUGHY**, Brookland, Tysoe, Warwickshire.

Non-arrival of Bulletins should be reported to **E. LEWIS**, 8 Parry Road, London S.E.25, with correct postal address.

Exchange Notices and advertisements to: **E. LEWIS**, 8 Parry Road, London S.E.25. (To reach him by 15th February, April, June and September.) Also requests for literature for prospective members.

Notice of change of address to: **B. J. BYERLEY**, 48 Elmgrove Road, Harrow, Middlesex.

Subscriptions to: **G. B. HODGES**, 42 London Road, Braintree, Essex.

Offers to lead field meetings, exhibit, etc., to: **D. P. GOLDING**, 517 Foots Cray Road, New Eltham, London S.E.9.

Applications for new membership to: **S. M. HANSON**, 167 Gunnersbury Park, London W.5. Also offers of help with AES work, and suggestions for improvements in our organization.

Silkmoth Reeler's Handbook. Data for the revised issue to: **W. J. B. CROTCH**, 5b Stanley Crescent, London W.11.



AES Leaflet 20.

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AES



No. 103

BULLETIN

JULY 1949

PROGRESS REPORT 1948

The year 1948 has been an erratic one from the AES point of view. During the earlier part, from January to March, only one bulletin and a membership list had been published, the latter being a belated 1947 issue. The Editor, Mr Cooper, realised that someone had to take over the office of *Bulletin* Editor, as he was too busy with other commitments for AES work. Fortunately, in response to his SOS, Mr Trought kindly offered to fill this vacancy and from *Bulletin* 92 commenced the hard task of not only editing future issues, but bringing them up to date. This was accomplished by October, and bulletins have since been sent to members with great regularity.

Members are now receiving the Wants and Exchange sheets during the months of March, May, July and October, and we are pleased to see that they are being well patronised. These sheets could not be produced, and sent, without the aid of the Publicity Secretary and *Bulletin* despatchers.

Many of our members have wondered when the *Journal* will be issued. Although this publication is complete but for a few details, the Editor of the *Journal*, realising that this was of a more permanent nature than a bulletin decided to wait until all his requirements were fulfilled rather than make do with material on hand. Members will be pleased to hear that good strides have been made in the last month towards the publication of the *Journal*.

Our chief publications in 1948 were the *Directory of Natural History Societies* and Leaflet No. 20, *Preserving Caterpillars*. The former is a steady seller to members, schools and libraries. A Supplement to this publication is now in the press.

In March we held our Annual Exhibition, which had an attendance of 300 people, including a large number of visitors. The success of this meeting was undoubtedly due to Mrs Adams, the Meetings Secretary.

The Council would like to draw members' attention to the fact that the AES is affiliated to the South Eastern Union of Scientific Societies and the Council for the Promotion of Field Studies. The Society is also represented by Mr Syms at the meetings of the British Insect Preservation Committee.

Lastly, I should like to thank all officers, councillors and members who have given up their spare time to help the AES during 1948.

S. M. HANSON,

Hon. Secretary and Organiser.

AGM AND EXHIBITION

The AGM and Annual Exhibition were held on March 26th, at Buckingham Gate Schools, S.W., as advertised in the March *Bulletin*.

About 300 people attended, half of them visitors, which was rather surprising considering the excellent weather prevailing at the time. Only about half of the members attending brought exhibits. The result of this was apparent by the number of spaces left on the tables. Perhaps all members attending will bring a contribution along next time.

Our thanks are due to Messrs Syms, Parmenter and Last for giving brief lectures; these were well attended and greatly appreciated.

The AGM took place after tea at 5 p.m.; the Council nominations as given in the duplicated circular with the March *Bulletin* were moved and officials and councillors duly elected, with the exception that Mr Trought becomes *Bulletin* Editor. Mr L. W. Siggs replaces Mr S. G. Abell and Mr C. H. Ison was elected to fill the vacancy on the Council.

Officers.

President—C. B. Pratt.

Vice-Presidents—B. A. Cooper and H. K. Airy Shaw.

Secretary and Organiser—S. M. Hanson.

Bulletin Editor—T. Trought.

Treasurer—P. C. Le Masurier.

Meetings Secretary—D. P. Golding.

Youth Secretary—M. H. Port.

Publicity Secretary—E. Lewis.

Councillors.

K. H. Bobe, B. L. J. Byerley, G. J. Cartwright, W. J. B. Crotch, G. B. Hodges, C. H. Ison, G. R. Myall, L. W. Siggs, L. R. Tesch.

The Secretary's report and that of the Treasurer were read and adopted unanimously. A discussion arose during the meeting as to the advisability of suppressing the *Journal* in future years, and increasing the size of the *Bulletins* in lieu thereof. The Council were asked to look into this matter and report their findings in due course.

The subject of humorous drawings in the *Bulletins* was raised. Although a few letters had been sent to the *Bulletin* Editor requesting their omission from future issues, the general feeling at the meeting was for their inclusion.

Lastly, one member requested help to protect the Chequered Skipper (*C. palaemon*) in a locality where it was in danger of extermination. It was suggested that he ask Mr E. Syms, our representative at the meetings of the British Insect Preservation Committee, to bring the case to their attention.

The AGM finished with a vote of thanks to the Chairman, Mr C. B. Pratt.

S. M. HANSON,
Hon. Secretary and Organiser.

ON THE INVERTEBRATE FAUNA OF A COAL MINE

During the past few months I have been brought specimens of several species of insects taken in the underground galleries of the Wyndham Colliery near my home. I am positive that none of these insects is native to the district, and I think they are worth recording here.

Among the specimens are four fine Timberman Beetles (*Acanthocinus aedilis*), two of each sex. This species of Longicorn beetle (Family *Cerambycidae*) is certainly not indigenous in South Wales, but is imported, as imago or in its early stages, in the timber used underground for making "pit props." This timber is mainly of Scandinavian origin, but the beetles which emerge from it are referred to by the miners as "Russian Bugs." Although occasional specimens of the Timberman are to be seen in those parts of a small hillside wood adjoining a colliery timber yard, they are apparently much more numerous in the underground mine workings,

where they seem to develop and emerge considerably quicker than is usual; possibly they are "forced" by the higher temperature. Recently, however, I am informed by miners from several local collieries that the introduction of new methods for keeping down the coal dust underground is rapidly bringing about the extermination of this and other insects.

The above-named is not the only Longicorn which is imported with colliery timber. I have received one or two specimens of another species, having a larger body, dark brownish, mottled with ochreous-grey, but with shorter, stouter antennae than the Timberman. I believe this is a species of the genus *Saperda* much resembling *S. carcaria*.

I understand that other species of *Coleoptera* also inhabit the underground galleries, as well as some insects of other orders, such as the magnificent Wood Wasp (*Urocerus gigas*) of the order *Hymenoptera* (Family *Siricidae*), of which I received one or two specimens of each sex. This insect is doubtless imported in its early stages, with foreign timber in the same way as the Longicorn beetles. Like them, it occurs occasionally in the timber yards and adjacent woodlands, as well as underground.

The darkness and warmth of the mine workings are also ideal conditions for the large Cockroaches, which are abundant. All the specimens I have examined were the American Cockroach (*Periplaneta americana*), which is common in shipping ports and warehouses, being, of course, another importation.

Lastly, I am told that various species of *Arachnida* are plentiful underground, though I have not been able to obtain any specimens for identification. However, *Tegenaria atrica* and one or two related species are common inside some of the pit-head buildings of the same mine, but are apparently fairly recent introductions.

As several miners have agreed to capture for me any insects they may come across underground, I intend to study the Invertebrate fauna of this mine more fully, though I fear that the increasing reduction in the population of insects in the colliery workings will soon lead to the extinction of many species there. I would be interested to hear from any members who have done any work on this subject.

TERENCE PARSONS (1513).

Mr Parsons will find an interesting note on "Insects observed in a Cornish tin-mine," by our member C. C. Townsend (451), in *Ent. Mon. Mag.*, 82, 197-8 (1946).

H. K. AIRY SHAW (545).

A CHEAP REFLECTOR FOR A SEARCHING LAMP

For those collectors who employ an ordinary hurricane lantern as a searching lamp on their nocturnal moth hunts, a large, clean sheet of tinfoil fixed around one half of the lamp-glass forms an excellent reflector. This increases the efficiency of the lamp greatly and throws out a good light over a wide area.

TERENCE PARSONS (1513).

SOUTH AFRICAN BUTTERFLIES

I have recently been spending about four months in South Africa, and took the opportunity to find out what I could about the native *Lepidoptera* south of the Zambezi. Of the 400 odd species of butterflies the majority are found in the more northerly subtropical regions of the area. As one travels south, numbers diminish, till at Grahamstown there are only about 100 species, and at Cape Town a mere 60.

I spent most of my time in the Transkeian Territories just south of Natal. Here, as probably elsewhere, butterflies are patchy. Large areas are practically devoid of them. Gardens seldom fail to attract a few, but the river valleys are more productive. There was, however, one small hill-top in Pondoland, partly covered with trees and scrub, which was a proper bug-hunter's Paradise. The best part of all is, naturally, the coastal belt, with its more humid atmosphere.

The *Lycaenidae* are an interesting group, numbering about 150. The majority are small and not very brightly coloured. The only species I had met before was *boetica*, which is quite common. This and *Vanessa cardui* are the only butterflies found both in this country and in South Africa. *Cardui* is ubiquitous, and usually smaller than in England.

Cotias edusa is replaced by *electra*, a very similar species, even with the pale variety of the female. It is sometimes considered a pest by lucerne growers. Another pest is the fine *Papilio demoleus* which defoliates the citrus trees. This is a truly

ubiquitous insect, and in most gardens it may be seen flying about lazily but restlessly, sometimes hovering at the flowers while it feeds.

There are a few mimetic species. The *Danaidae* and the *Acraeidae* are distasteful to birds, and other more vulnerable species seek protection by imitating them. There is one *Papilio*, *P. merope*, whose females mimic three different species of *Danais*, and it is said that a single batch of eggs may produce specimens of all three forms of the female, besides the completely different male.

I never actually saw a bird attacking a butterfly, but I caught specimens with slices cut out of the wings on both sides, shaped like a bird's beak. I also saw a Pierid caught on the wing by a large fly and instantly killed, though not visibly damaged in any way.

Any entomologist who wants opportunities for field work and for research will find ample scope for both in South Africa, where the country is so vast, and so much of it as yet unexplored by naturalists.

I should like to take this opportunity of acknowledging my indebtedness to Dr Hewitt, of the Albany Museum, Grahamstown, for his kindness in lending me books, and allowing me the run of the collections of insects in the Museum.

E. M. GIBSON (311).

PRE-FABS. FOR COCOON-SPINNERS

Those who are in the habit of rearing cocoon-spinning larvae in some numbers may be interested enough to prepare very simple housing for them in advance. All that is wanted is a supply of stiffish paper, covers of old exercise books or files, or the kind used for Braille correspondence with blind people.

Prepare ten exactly similar rectangles on the pattern shown below (fig. 1) and make five cuts in each as shown by the heaviest lines.

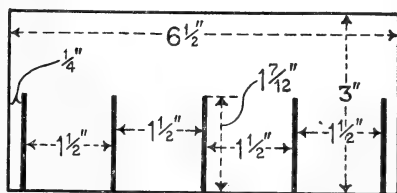


Fig. 1.

The dimensions given are suitable for exotic silkmoths; slightly smaller rectangles would suit eggars, drinkers or British emperors, but there is no harm in giving plenty of room to the smaller cocoons.

To build the nest of pre-fabs, arrange five rectangles parallel to one another with the slots upward. Then key them together with the other five, slots downward, at right angles, slipping slot into slot. The result will be a sort of egg-box as shown in figure 2.

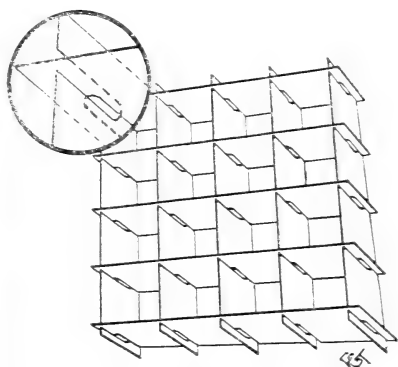


Fig. 2.

Until they are wanted they can be "collapsed" flat. When the caterpillars are ready to spin, open out the pre-fabs; strengthen the outer buttresses by little angle-brackets of stamp-paper; pop the larvae in, one to a compartment, and cover the whole with a square of glass. It is best to interpose some cellophane or tissue paper between the box and the glass, because the larvae are likely to spin against the top surface and then you would not be able to lift the glass to introduce more caterpillars.

This system makes winter-storage very easy; whole pre-fabs moreover can be put into a breeding cage for emergence in due course. If you have a supply of square or rectangular tins you can make your pre-fabs, to fit them by omitting the outer rectangles and buttresses; but first line your tins with newspaper or blotting paper.

I am indebted to P. G. Taylor (719) for very kindly making the drawings.

W. J. B. CROTCH (1181).

A CORRECTION

Mr J. H. PAYNE (353) draws attention to an error in his article "Rearing the Marsh Fritillary" in *Bulletin* 101, p. 33, in the paragraph headed "Imago." This should read, instead of "After killing, etc.," "After emergence place in pill-boxes in a cool dark place, they will then harden and lose some tendency to bleed after being killed for setting." The Editor regrets this mistake, which was an editorial one.

THE SWALLOWTAIL

W. R. F. ADDISON (230) writes:—"I have been most interested in the article in the *Bulletin* on rearing *P. machaon* from ova, and have been surprised to learn that loss in rearing has occurred. In Norfolk we do not trouble to raise *P. machaon* from ova, but obtain the larvae when nearly full-grown from the reeds or, generally, the food-plant, *Peucedanum palustre* (Milk Parsley), in July.

Caterpillars from the August hatch, when available, I should think, would feed up very rapidly.

The usual season for *machaon* is May 15th to June 15th. But from larvae gathered in July, perfect butterflies have hatched out in April, May, June, July and August, and a few have been in the chrysalis state for two years (this is rare). At Hickling and Horsey nearly every year there is a late hatch (August) which the local people refer to as the Large Swallowtail. I have one and it is large, but I think a female. The melanic variety occurs now and again at a Broad near here. Should anyone wish to visit the Broads, I could give them information."

BREEDING THE DUKE OF BURGUNDY FRITILLARY

On Whit Monday, 20th May 1939, Mr Hilliard and I decided to visit a place 40 miles distant where I knew *H. lucina* occurred. Their habitat consists of a narrow gash in the chalk hills no more than 300 yards long, open to the west and surrounded on the remaining three sides by well-grown beech woods. The sides slope up very steeply towards these woods and in the north-east corner are clothed with coarse grass, amongst which cowslips grow, barely discernible at this time of year. We arrived here about 11.30 a.m.; the sun was shining brightly and we were delighted to find *lucina* flying in fair

numbers. Both sexes were on the wing and we each had a few good specimens in a short time. I was lucky enough to take a pair in *cop*, which I carefully boxed with the idea of breeding from them.

On reaching home in the evening I hastily potted up a healthy "*Polyantha*" plant. There were a few green-fly on it so I had to examine each leaf carefully and remove this pest, which breeds astonishingly when protected in a sleeve. Over the pot I placed a roomy book-muslin sleeve of the "meat-safe" variety. Inside this I released the pair which, incidentally, had separated within an hour of capture. Inside the sleeve I put a small vase of flowers—candy-tuft and London-pride—which I renewed when necessary. I stood the whole thing on the lawn under a small apple tree which gave a little shade even at midday.

A few days later I found ants walking about inside and out. I imagined they would consider new-laid eggs or young larvae a delicacy, so I stood the flower pot on another in a basin of water and removed those ants I could find. Any others I hoped would be drowned on the way home.

The male died within two days; the female was still alive when I went for my summer holiday on the 14th June. I could see a number of eggs laid on the underside of the *Polyantha* leaves and later I found that they were always affixed alongside the midrib or inside curls at the edges of the leaves.

When I returned home on the 29th June a few larvae had appeared and were eating small round holes in the leaves. A week later the food-plant was in a very bad way from the attacks of the larvae and also the greenfly, which in spite of my efforts to exterminate them had multiplied like the Children of Israel! So I decided to transfer the larvae to better quarters. I selected a wooden breeding cage with glass front and perforated-zinc side and top: in the middle I stood a small pot of water (3 inches high) and filled the cage up to the level of this with coarse dry moss, such as is found growing in oak woods. I cut a dozen or so *Polyantha* leaves with stalks as long as possible and put them in the pot; some curled down on to the moss. The potted *Polyantha* was then cut down leaf by leaf and those with

young larvae and still unhatched ova on them were transferred to the cage.

The remainder of the ova hatched and the larvae fed well. They spent the day hidden in the moss, coming out to feed when it was dark. Aphid was still a nuisance: I had to wash them off under the tap and leave the food-plant some time to dry before putting it in the cage.

By the 27th August all had pupated and later I discovered 33 pupae amongst the moss; considerably more than I expected.

With regard to pabulum, I used garden varieties of *Polyantha* all the time with the addition, during the latter part, of a purple variety of *Primula* with profuse shiny foliage; this proved equally acceptable. Both plants kept admirably in water.

JOHN E. KNIGHT (94).

THE SOUTHERN AESHNA AND ITS NEW LOOK

I well remember how, on seeing for the first time Miss Longfield's well-known book, *The Dragonflies of the British Isles*, I was struck by the fact that the subject selected for the only coloured plate was that beautiful insect, the Southern Aeshna (*Aeshna cyanea*). To this day, every time I open the book (which is pretty often) I find myself taking yet another look at that colourful frontispiece before going on to the more serious business of searching for information.

Most odonatists, I imagine, count this large and lovely Aeshna as a particular favourite: its wide popularity seems in no wise diminished by the fact that it remains quite common; indeed, no other Aeshna in the South is more plentiful. Moreover, it is a ubiquitous insect, with a taste for urban life as well as rustic seclusion. Even in large towns, including the Metropolis itself, it turns up fairly frequently and may be seen flying speedily along roads or over roofs as well as paying more leisurely visits to the garden. And no matter where your ornamental pond is located, you have a good chance of attracting this dragonfly there with, possibly, an opportunity to witness oviposition by the female.

Powerful on the wing, *Aeshna cyanea* can fly high when fancy dictates or occasion demands. In late evening, especially just before dusk (though it often flies long after the sun has set), this dragon-fly with

its long, cylindrical abdomen and shimmering wings loves to hawk for midges and other small prey along narrow woodland rides, on rough hill-sides, at the edges of heaths and by the hedgerow in the meadow. Its flight level may vary from a foot or so above ground to tree-top height or even higher; one moment skimming just above the littered pine-needles it may be seen, next, sweeping round the gently waving tips of the trees that shed them.

More than once I have seen *cyanea* still on the wing in the warm stillness of the summer dusk; or have watched the graceful insect "hook up" to a convenient twig or gorse spine for the night. It is conservative in its choice of haunts; invariably regular as clockwork—weather permitting—in patrolling its selected "beats." By no means difficult to capture by hand if required for study it is best taken either early in the morning or late in the evening, though if you know the haunts of familiar individuals a visit during a dull spell might prove profitable. As a rule, it hangs vertically from its "moorings": so that, with a modicum of caution, and by dint of approaching from behind—keeping below, rather than above, the insect—it is possible to grasp it quickly but firmly, without damaging the fragile wings, at the point where the thorax joins the abdomen.

In keeping with its late habits, the Southern *Aeshna* may undergo its metamorphosis at a comparatively late hour in the day. And its "new look," unlike that affected by so many of our womenfolk to-day, definitely is new, in every sense of the word; for the resplendent adult dragon-fly, with its delicately enamelled abdomen, yellow—or grass-green—thorax marked with brown, and gleaming saffron-tinted wings, is to the dull-hued, ugly-looking nymph as gold to lead, or a sparkling stream to a stagnant pond. To watch the newly-emerged dragon-fly gradually assume its gorgeous colours, fill out, and finally attain the perfect state, is to be vouchsafed a thrilling and at the same time deeply satisfying revelation of one of the many remarkable manifestations of the workings of nature: a phenomenon which loses none of its absorbing interest and fresh appeal no matter how many times repeated in other individuals of the order.

Here it may be as well to point out, for the especial benefit of those who have but a superficial knowledge of the life-histories of dragonflies, that some days may elapse before the teneral, or immature, stage is left behind and the full and permanent colours attained. Even then, the colours are not always perfectly constant; for example, in some species the wings develop a deeper hue—usually towards saffron or brown—as the individuals reach relative old age; and then again, in some cases decidedly striking colour forms are evolved. In some species the sexes do not differ markedly, while in others they may easily be told apart: young males often resemble old females to a considerable degree, but develop their characteristic coloration as they become really mature.

PETER MICHAEL (748).

(To be continued.)

ABNORMALITY IN A STAG BEETLE

The following diagrams (Figs. 1 and 2) illustrate an abnormal growth on the right mandible of a Stag Beetle (*Lucanus cervus* L.), taken by myself at Guildford, in 1935.

The growth takes the form of a cylindrical lump, inclined slightly forward, with a shallow cavity in the top, the colour, and apparently the composition, being similar to the mandible.

The width of the mandible bearing the growth is, near its base, about double that of the left mandible, and the height of the growth, measured from the upper surface of the mandible, is 4.5 mm.

It has been suggested that the malformation may have been caused by some injury received during the larval, or possibly early pupal stage.

This specimen was described and figured by Mr E. S. A. Baynes, F.R.E.S., in the *Entomologist's Monthly Magazine*, 6th August 1946, and my acknowledgments are due to his contribution, on which this is based.

G. C. HOLROYD (253).



FIG. 1.

FIG. 2.

WHAT WAS IT?

With reference to W. J. B. Crotch's question (*Bull.* 102, p. 39), surely this was a sawfly larva, several of which have this waxy white colouration, feed on bramble, and rest in a coiled-up attitude. Mr Bernard Verdcourt suggests that the snail may have been a species of *Helicella*, and, *à propos* "caterpillars counterfeiting snails," gives the following interesting reference: "The larva of a moth belonging to the Psychidae, and occurring in France, Germany, the Tyrol, and Syria, coils itself up into a sinistral spiral of three whorls, and is aptly named *Psyche helix*, a kindred species from Italy being known as *Ps. planorbis*" (A. H. Cooke, 1895, *Cambs. Nat. Hist.*, 3, Molluscs and Brachiopods, 67-68).

H. K. AIRY SHAW (545).

Captain C. H. MICHAELSON, R.N.

It is with great regret that we record the death, on April 2nd, 1949, of Captain C. H. Michaelson, R.N. (436), of Blakeholme Farm, Newby Bridge, Ulverston, Lancs.

Captain Michaelson was a very keen member of the AES and was formerly Verderer of the Scout Camp at "Great Tower," Windermere.

A. J. P. SPEIGHT (490) writes:—He was a keen naturalist, in the full sense of the word and did much to infuse his interests into everyone he knew. Hundreds of Scouts throughout the world owe him a great deal for opening their eyes to the wonders of Nature and for showing such interest in their future progress. Until the last he did all that he could to help the people with whom he came into contact. He had a cheery word for all, and from the depths of his experience could recall something to suit all tastes. He was not a specialist in any particular branch, but there were few things on which he had nothing of interest to say. He was loved by all who knew him. Many of us have lost a good friend.

HOWARD M. MERRILL (640) writes:—"Skipper," to many of the Scouts camped at Great Tower, was always willing to help anybody interested in Nature Study, especially "bug-hunting," his own hobby of later years. Many Scouts who camped there came away enriched by the knowledge and enthusiasm he had imparted to them. He was always cheerful, ready for a chat, answering

questions or making suggestions. As I think of those days spent at Great Tower, I realise that with "Skipper's" death the Scout Movement has lost a true friend and a good man.

HINTS FOR JUNIORS

(Continued from page 19)

Field Tins.—Useful and attractive field tins can be made from cough lozenge or first-aid plaster tins. Those with hinged lids are best.

First place some small pieces of red, blue, green, or any coloured sealing wax in an old cup or a potted meat jar. Pour over just enough methylated spirits to cover these—experience will tell you exactly how much. Cover and leave overnight. In the morning the wax will have dissolved down into a lovely smooth paint.

Colour your tins, using, if you like, one shade for the inside and a different one for the outside. The paint should be thick, but applied sparingly, and two coats will be found to be necessary. Line the bottom of the tin with cork, making it fit in tightly.

You will have made a useful tin in which you can pin your insects as you transfer them, in the field, from the killing bottle.

PAMELA C. BAIN.

TETRACHLORETHANE

Since the publication of my note in *Bull.* 100, p. 19, Dr C. B. Williams, under whose authority tetrachlorethane was and still is used in the Rothamsted light-traps, has told me that following the publication of his recommendation of its use (in the *Proc. R. Ent. Soc. Lond.* (A), 23: 80-85) it has been pointed out to him that it is described in a recent book (*Forensic Medicine* (1947), p. 321) by Dr Keith Simpson, as being a cumulative liver poison.

The only known casualties that have occurred from tetrachlorethane itself were to men employed, probably "in an atmosphere of it," doping aircraft fabric in World War I. Thus it seems that its judicious use as a killing-agent is harmless enough, *provided care is taken*, and this opinion has been confirmed by Dr Keith Simpson.

PETER G. TAYLOR (719).

COLLECTING LEPIDOPTERA IN JULY.

In July many people think of holidays, so I want to talk about some of the methods of obtaining specimens that one would not normally have time to employ.

First a word of warning—there are bound to be disappointments, for it is not all as easy as it sounds, and not every bough bears the Golden Fleece.

In this month of the year larvae on the moors are small and difficult to find; the way to find them at this stage is to pick out an area of fresh-looking heather and work systematically; only in this way will they be found, as it is usually useless to look for them at random. Many moths are to be found on open headland and heath by day, one of the most notable being the Emperor (*S. pavonia*). This moth has a name for "assembling," and for details about this I can refer the reader to an excellent chapter on the subject in Allan's book, *A Moth Hunter's Gossip*. This method is undoubtedly the best way to obtain the really perfect specimen.

It is impossible to use a beating tray as it would soon be the worse for wear—one just has to use one's eyes.

Another favourite spot on the moors to find larvae is on the verges of rough paths made by man or beast among the bracken and other undergrowth. The larvae seem to enjoy the openness and sun, and often sit quite brazenly and unafraid on their respective foodplants. Frequently ichneumon flies are about—a sure indication of the presence of larvae, as these flies seem to possess an uncanny knowledge of where to find their victims.

Now about the butterflies: in 1943 there was a great invasion of Bath Whites (*daphidice*) into this country. Many of them were seen off the Cornish coast; and they had a habit of flying a few yards away from the cliff just out of reach, or too high in the air to take. This happens with many of the immigrant butterflies and many times has the collector seen his valuable prize so near yet impossible to capture.

Unless there are a considerable quantity in the locality it is very wrong to capture and kill any number of specimens just because they are rare; surely it is better to get a female specimen and hope that she is fertile, or if you wish to be on the

safe side capture her a husband at the same time and breed from them. Several well-known localities have been ruined by the heedless killing of many specimens in a well-established place; it was in this way that the Large Copper became extinct.

Now a good way to lure these elusive ladies and gentlemen down to earth so that you can observe them more easily is this:—Find out where they are flying, whether just along the coast line or high up in the air inland, then spread on the ground a large sheet of newspaper near to where they are and if they are feeling in a literary mood they may come floating down to earth to see what this dazzling white thing is, and then comes your chance.

Moses Harris, writing in his *Aurelian*, says that he found this way extremely good for catching the Purple Emperor, as this butterfly often flies very high among the topmost branches of an oak tree.

In July the year's brood of Hawkmoths should be nearing their prime and the following method is useful to know for obtaining nearly full-grown larvae. It must be remembered that these larvae cling very tightly to their foodplant and if you accidentally tap the branches they will take warning and hold on all the tighter. So one must catch them on the hop. Select a branch that is not too unwieldy and underneath it spread out a sheet of paper, then hit the branch as hard as you can with a stick; this jars the bough and flings the larvae, if there are any there, from their perch and they fall, we hope, right into the middle of the sheet of paper you have previously placed below. In this way many varied and interesting types of insects may be found. It has happened, of course, that there was a wasp's nest on that branch and the results of your catch have been somewhat marred by their attentiveness; just see that this does not happen to you.

J. A. DALE (1206*).

EUROPEAN CO-OPERATION

Members are reminded that facilities exist for correspondence with members of some European Amateur Entomological Societies. The Vienna Entomologists' Society would like to correspond with English Entomologists; Mr Hans Ryszka, their Editor, would particularly like to corres-

pond with a member interested in the Swallowtail butterflies (*Papilio* spp.). Any member who would like to participate should write to the Youth Secretary, 31 Pinner View, Harrow, Middlesex.

REVIEWS

Skokholm Bird Observatory Report for 1948. (Published by the West Wales Field Society, pp. 36, 8½ × 5½, March 1949; price 2/6.)

This issue, the second, is practically twice the size of the 1947 Report, and is up to the usual high standard of the West Wales Field Society's publications. AES members will be interested by the two page list of Skokholm *Lepidoptera* for last year, which contains two additions to the previous year's list. These are the Ringlet Butterfly (*Aphantopus hyperanthus*) and *Utetheisa ornatrix*, an American moth which has never before been recorded in Britain. There is also an extremely interesting article on the ecology of *Lycosid* Spiders on the island, occupying four pages, with a very useful bibliography. In addition, the issue contains extensive lists and descriptions of the birds, mammals, reptiles, and amphibians, and the higher *Fungi* recorded from Skokholm. The annotated flora and fauna lists for Grassholm Island during 1948 contain only one *Lepidoptera* record, namely, a Painted Lady Butterfly (*Vanessa cardui*). There should be something of interest to almost everyone in the wide field covered by the various articles and lists, though, apart from the *Arachnida*, the less popular Arthropod orders have been entirely neglected apparently. Surely here is an excellent opportunity for some AES members. The accent of this report is on ecology and the compilation of exhaustive flora and fauna lists for Skokholm and Grassholm. It is concise, clearly printed, and altogether very well produced, being quite worth the published price of 2/6. It is obtainable from Col. H. Allen, D.S.O., Hon. Sec., West Wales Field Society, The Red House, Heywood Lane, Tenby, Pems.

TERENCE PARSONS (1513).

British Butterflies, by Vere Temple. Collins Ltd., London, 48 pp. + 8 coloured plates and 22 illustrations in black and white; 5/-.

This little book, the latest addition to the literature appertaining to

the history of British Butterflies, is of interest and the text is attractively expressed and free from those customary quotations from old and out-of-date works, which so irritatingly perpetuate errors. It is, however, not entirely free from errors—one bad mistake is to be found on page 12, where "blackthorn" should be "buckthorn," and the caption under the Aurelian plate facing page 32 is quite wrong. Again the chapter on the Life Cycle is so open to criticism that it would have been better if it had been omitted.

The chapter on Butterfly Vision indicates the results of experiments that have been made on this matter which are not entirely convincing and often contradictory. The statement on page 8 that butterflies do not see what we see nor hear what we hear, is too far reaching and remains to be proved. That butterflies have an acute sense of smell is decidedly apparent to anyone who has collected the Silver Washed Fritillary (*Argynnis paphia*) in the New Forest and elsewhere. There is certainly some other sense used in conjunction with vision and smell that we have at present no knowledge of.

Criticism may also be expressed with regard to statements made with respect to distribution of such species as the Marbled White, the Brown Hairstreak, the White Admiral and the Silver Studded Blue. With regard to variation, the statement that the Hedge Brown does not vary much in colour or form is not correct, as many and various shades of colour are found, from pure white to dark brown. The ocelli also vary considerably in number and are sometimes lanceolate instead of round.

The figure of *Maniola jurtina* (Meadow Brown) which I assume is intended to represent the type, actually depicts a very rare and striking aberration. In the type the band on the lower wings is not of such vivid colouring, nor is it split up into oval wedges.

With regard to the plates, these on the whole are disappointing and scarcely up to modern standards. No exception can be taken to the black and white drawings of the authoress, but the coloured reproductions from the *Aurelian* and "Wilkes" are far from equal to the originals. It is a pity that the authoress did not confine the plates to some of her own execution, as they would have been

far more attractive and interesting. Mr N. D. Riley, of the British Museum, has already issued a small book containing excellent reproductions of some of the plates from the *Aurelian*. To see colour printing at its best, the recently issued book on Italian *Lycaenidae*, by Dr Verity, of Florence, should be consulted.

S. G. CASTLE RUSSELL (119).

A Guide to the Smaller British Lepidoptera, by L. T. Ford, B.A. (pp. 230, $8\frac{1}{2} \times 5\frac{1}{2}$). The South London Entomological and Natural History Society, 1949; price 15/-).

This book is a very welcome attempt to do for the "Micros" what Scorer's *Logbook* did for the "Macros," and Mr Ford, as one of our foremost microlepidopterists, is well qualified for the task.

The species, each of which is serially numbered, are listed systematically following the classification used by Meyrick in his *Revised Handbook of British Lepidoptera*. This involves looking in the index for an unknown species, but has the great advantage that the times of appearance and foodplants of a complete genus can be referred to at a glance.

Under each species is given, *where known*, the time of appearance of the ova, larva, pupa and imago; where the ova are laid, how the larva feeds and on what plants, where and how it pupates, and short notes on the habits of the imago. We have italicised the words "*where known*" above, for besides collecting together all the known information this book shows up the great gaps in our knowledge of some of the "Micros." To take an example, in not one of the 37 species of *Argyroplote* listed is anything known about the ova, and in only 9 cases is anything known about the pupa. It would have been an advantage if inter-leaved copies of the book were available so that notes from personal observation could be added. The total information collected together by Mr Ford is, however, both immense and invaluable.

The index of foodplants lists the species occurring on each by the serial numbers they are given in the

body of the work. This makes them easy of reference. This index is, however, very inconsistent in that the scientific and English names are mixed up, sometimes one being used and sometimes the other. In only a few cases is a cross-reference given.

The Genera and Species index, including synonyms, is very complete and accurate. We have only noticed one printer's error (*scovparia* for *scoparia*).

The book is very well printed and strongly bound and both Mr Ford and the South London Entomological and Natural History Society are to be congratulated on its production.

It will be an invaluable asset to the microlepidopterist and we also recommend it to the macrolepidopterist in the hope that it may encourage him to collect our smaller moths and so fill some of the many gaps in our knowledge of them.

BRIAN O. C. GARDINER (225).

The *School Nature Study Journal*, Vol. 44, Nos. 174 and 175, have been received by the Editor. These quarterly journals are more botanical than entomological in their appeal, and, as their name implies, are particularly intended for school teachers. Many of the articles, however, are of great general interest for the naturalist, whatever his speciality may be.

AES PUBLICATIONS

LABEL LIST (3/6) and Check List (1/6) of British Lepidoptera (together 4/3). Label List of British Butterflies (4d). The Hymenopterist's Handbook (7/10). [To non-members, 10/10]. Experiments with Bees (AES Leaflet No. 10, recently published), 7d each; 5/- per dozen.

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Non-arrival of Bulletins should be reported to E. LEWIS, 8 Parry Road, London S.E.25, with correct postal address.

Exchange Notices and advertisements to: E. LEWIS, 8 Parry Road, London S.E.25. (To reach him by 15th February, April, June and September.) Also requests for literature for prospective members.

Notice of change of address to: B. J. BYERLEY, 48 Elmgrove Road, Harrow, Middlesex.

Subscriptions to: G. B. HODGES, 12 London Road, Braintree, Essex.

Offers to lead field meetings, exhibit, etc., to: D. P. GOLDING, 517 Foots Cray Road, New Eltham, London S.E.9.

Applications for new membership to: S. M. HANSON, 167 Gunnersbury Park, London W.5. Also offers of help with AES work, and suggestions for improvements in our organization.

Silkmoth Rearer's Handbook. Data for the revised issue to: W. J. B. CROTCH, 5b Stanley Crescent, London W.11.

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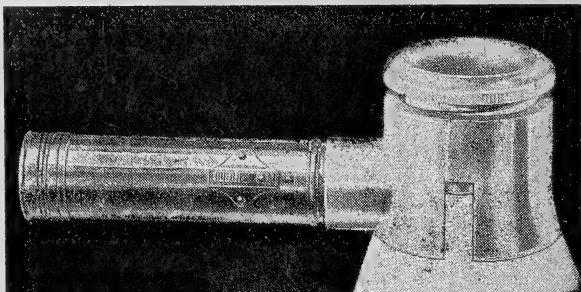


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No. 104

BULLETIN

AUGUST 1949

EDITORIAL

After his first twelve months of editing the *Bulletin*, the Editor would like to express his gratitude to those members who have contributed articles and notes. Without them, of course, there would be no *Bulletin*. He hopes that the old proverb of gratitude being a "lively sense of favours to come" will appeal to those members. He would like, also, to welcome new contributors.

He would also pay tribute to the regular proof-readers, Messrs W. J. B. Crotch (1181) and H. K. Airy Shaw (525) for their great help, not only in proof-reading, but in editing.

FLIES

At the Annual Exhibition Mr L. Parmenter (895) gave a short talk on *Diptera*. He began by showing a fine large painting, by Mr C. O. Hammond, F.R.E.S., of the large Robber fly, *Asilus crabroniformis* L. The various distinctive parts of a fly were pointed out.

The lecturer then gave an outline of the many sides of the study of flies and illustrated his remarks with an exhibit of species representative of the most notable families of the Order. *Tipula rufina* Mg., a crane fly found in towns, was stated to have bred on the bombed sites in the City of London. The dancing of male winter gnats such as *Trichocera saltator* Harr. led to a commentary on the varying types of dances made by *Chironomidae*, *Tipulidae*, *Cecidomyiidae*, *Stratiomyidae*, etc. Next came *Phychoptera albimana* Fab., one of a number of species with aquatic larvae, in this case with a long telescopic breathing tube. The tiniest fly shown, *Culicoides obsoletus* Mg., a vicious biter, was compared with the great handsome *Asilus crabroniformis* L., which was found on short turf. The adults prey on grasshoppers, beetles and large flies. *Bibio marci* L., St Mark's fly, well known by sight, if not by name, to most entomologists, breeds in turf.

The adult is abundant in May in the sunshine, flying quite high at times. Another fly, *Empis tessellata* Fab., preys on it and it is liked also by such birds as the Garden Warbler and Starling. The gall-causers, *Cecidomyiidae*, were represented by *Lasioptera rubi* Heeg. Their larvae form galls on bramble stems. The last of the *Nematocera* discussed was *Mycetophila fungorum* Deg., a fly typical of those reared from a number of species of fungi.

The handsome black and white Stratiomyid *Nemotelus uliginosus* L. is a fly of the sea coast salt marshes, where it occurs with other species of this genus. A comparison of their life histories and habitat preferences would be very interesting and is typical of the enormous amount of original scientific work that any amateur might undertake. A large fly often seen resting on the trunks of trees near streams and marshes, nearly always with its head down, is the Woodcock fly, *Rhagio scolopacea* L. Only the males sit like this as they watch for passing females with whom they quickly attempt to mate. Another fly of the marshes is *Tabanus distinguendus* Verr., one of the large biting flies, *Tabanidae*. The hump-backed *Acrocera globulus* Pz. is one of the three *Cyrtidae* in this country. They are parasitic on spiders but are not very common.

One of the prettiest flies is *Thyridanthrax fenestralis* Fln., a Bombyliid, found on sandy heaths generally resting on the hot sand itself. *Thereva annulata* Fab. is the silvery fly so often seen in August on the open sand of the sand dunes of our coast. The seaside rocks have their attractions as well and *Liancalus virens* Scop. is to be found on wet dripping rocks. It is one of the *Dolichopodidae* and like several others of the family is noted for its courtship display. The males have silver wing tips contrasting with their general smokiness; these greenish flies are most attractive when the wings are waved on the approach of a female. *Empis femorata* Fab. has a different type of courtship. The males like to

fly to and fro below trees and capture passing *Dilophus* and *Fannia* flies. Their prey is almost always a male since the males of these species also fly to and fro awaiting females. The male Empid will carry its prey for some little time until a female approaches and then presents the dead fly to her before mating.

The *Phoridae* is a family of many small flies which are to be seen in many habitats, some running over leaves of trees and bushes. *Phora aterrima* Fab. males, besides having the typical Phorid gait, are also found dancing in the air in the sunshine. The parasites of Homoptera—Plant bugs—are the *Dorilaidae* = *Pipunculidae* and *Dorilus campestris* Verr. is found over a wide area. One of the flower visitors, *Rhingia campestris* Mg., a Hover fly or Syrphid, breeds in cow dung. Curiously in 1948 it was very rare in the south-east of England but abundant in the west. It is normally double-brooded and very numerous.

Parasitic on bees and wasps are the *Conopidae* and *Conops vesicularis* L. is perhaps the most handsome. The life history of the wing-spotted *Herina lugubris* Mg. has still to be discovered. It is, like so many other *Otitidae*, an inhabitant of marshes. The *Trypetidae* are generally very beautiful, mostly with spotted or barred wings and *Goniglossum wiedemanni* Mg., which breeds in the berries of Bryony, is found almost wherever its host plant exists. Another plant feeder, but this time a leaf-miner in docks, is *Norellisoma spinimanum* Fln., a member of the *Cordiluridae*.

The family supplying the bulk of the dipterous parasites of Lepidoptera and other insects is now called *Larvaevoridae* (previously *Tachinidae*) and *Larvaevora fera* L. is a well-distributed species so often seen visiting flowers. One of the smartest of the *Muscidae* is *Mesembrina meridiana* L. with its handsome yellow-based wings and shining black body. The eggs are laid in cow dung. Flies even inhabit birds and bats. *Ornithomya avicularis* L. of the *Hippoboscidae*, which is found on a variety of birds from Owls to Chaffinches, is also to be noted for its interesting birth. The egg hatches in the body of the female and a full-grown larva eventually emerges from her body and almost immediately pupates.

MITES ON BUTTERFLIES

I wish to confirm the remarks of K. A. Spencer (1563) in *Bull.* 102, p. 36, on red mites. I have found these mites, both in Kent and Berkshire, on *M. galathea* and agree with him that if removed with a pin before setting, the specimens suffered no subsequent damage. The mites in question were a very bright red colour, and could in no circumstance be regarded as brown.

S. DEXTER (847).

NOTES AND OBSERVATIONS

ALAN P. MAJOR (1117) writes:—On March 26th, 1949, I saw a Comma (*Polygonia c-album*) flying around the blossom of a cherry-plum tree in an orchard close by the roadside. It was very bright in appearance, and in perfect condition. Was it a hibernator or a newly-emerged butterfly? It was in such a fresh condition that I venture to suggest it was an out-of-season emergence and that it had only been on the wing for a few hours. The weather at that time was extremely warm and everything in the butterfly world seemed to be about two months early.

AC1 W. M. ELLISON (1318) reports seeing a few Clouded Yellows (*C. croceus*) at Gloucester on June 12th, 1949.

A PARASITIC BEETLE

I read with interest the article by K. C. Durrant (1375) (*Bull.* 100, p. 29) on *Metoecus paradoxus*. I have taken this beetle at North Harrow in nests of *V. germanica*. Coleopterists may be interested in the method I have used in taking this elusive beetle.

Throughout early summer the position of nests of *V. vulgaris* or *V. germanica* are noted. During the second and third weeks in August (this is when the beetle is ready to leave the nest) the whole nest is collected in a cloth bag. The bag is then placed in a 7 lb. biscuit tin and a teaspoonful of ethyl acetate added. The lid is then put on the tin and left for a few hours—I usually leave it overnight. The contents can then be spread out on a large sheet of paper and examined at leisure.

B. L. J. BYERLEY (788).

AN IDEAL SPOT

Although I have been in London about three years, I have not yet dis-

covered the "ideal" collecting ground in the South, such as the one, between W— and G— (in the Lake District) where I was taken in 1942 by the Rev. E. J. Nurse, a well-known entomologist.

The day was hot with a haze, ideal from the bugs' point of view, but we were nearly dead at the end of it. This place was more than a dream come true. It is no exaggeration to say I did not know what to go for next and was almost bewildered at the number of specimens to be seen. It is a favourite spot for the Large Heath (*C. tullia*) and in whatever direction I glanced, day-flying moths were dashing about. I took Oak Eggars, Fox moths, Emperors, and one Wood Tiger. A fast flyer, closely resembling a humble bee in flight, was the Beautiful Yellow Underwing (*Anarta myrtilli*). The attractively-coloured Clouded Buff was to be seen and there were numerous Bordered Whites, Common Heaths and Latticed Heaths. There were the usual common butterflies and a few Fritillaries. Of the smaller moths, there were the very pretty little Purple and Gold, Four-Dotted Footman and Tawny Barred Angle. There were plenty of Carpets, the White Spot, a few pugs and Speckled Yellows. The small yellow flowers of the Rock Rose attracted countless numbers of the Brown Argus butterfly.

After dark, "sugar" yielded a good harvest. This seemed to be a kind of "witches' brew" attracting six or more to every patch. Many rare and interesting specimens turned up, with numbers of smaller moths I was unable to identify. I must confess that never since have I had any luck with sugaring, which is disappointing, having seen what can be done with the correct mixture.

Of course, the place is quite well known and mentioned in South's volumes, but I have yet to find its equal round about the South: *perhaps there just isn't such a place anywhere else*. I should be interested in other people's accounts of collecting in that district. Providing one knows the spot and is lucky in having the right weather, one can't go wrong.

W. M. LE FLEMING FORBES (1105).

WHAT WAS IT?

The following quotation from A. D. Imms' *Textbook of Entomology* may answer W. J. B. Crotch's ques-

tion in *Bull.* 102, p. 39. On page 455, third (1934) edition, under the heading *Psychidae* (Bag-worm Moths), there is an account of the larvae of these moths, which live in cases made of a great variety of materials and of different shapes. They carry the cases with them as they wander over their foodplant. The genus *Apterona* has these cases "wholly constructed of silk and are extremely close copies of *Helix*-like shells."

GLASS SLIPS FOR SETTING

My allusion to the use of glass slips for setting big-winged moths in *Bulletin* 96 ("A Variable Setting-board," p. 231) seems to have aroused some interest; but it appears that the precise method is not self-evident. The accompanying diagram (Fig. 1) shows how the setting is done.

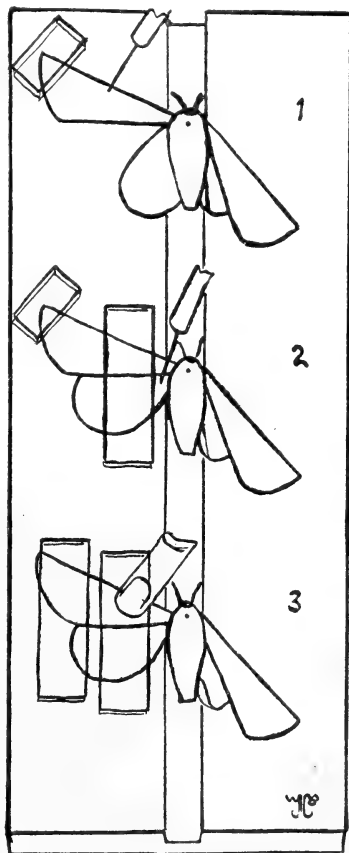


Fig. 1.

Firstly, with the setting needle move forward a forewing into the correct position and drop gently on to the tip of it, but at an angle, a small rectangle of glass, preferably of weight heavier than that of a microscope slide.

Secondly, manoeuvre the rearwing into place beneath the forewing by use of the needle near the middle of its base. Then drop a micro. slide over them both, parallel and close to the body.

Thirdly, put slight pressure from a right-hand finger upon the slide; remove the original small rectangle; and place a second micro. slide beside the first.

Repeat for the other side. If the insect is not perfectly relaxed, the manipulation of the second side may slightly derange the first. With a little practice, the slightest lifting of the slides fore or aft will enable perfect positions to be restored. You can see quite clearly that everything is as it should be.

W. J. B. CROTCH (1181).

OBITUARY

We record with deep regret the death of G. Nicholson (33), quite peacefully, at his home in Newcastle-on-Tyne on February 10th this year. He had been ailing for a long time and his death was undoubtedly accelerated by the death of his wife last October. He was a keen member of the AES and loved his nature work very deeply. He continued to study and collect until his strength failed. He passed on his skill in observation and his love and reverence for Nature to his family and friends.

NOTES ON MOUNTING INSECTS

In the *Entomologist's Monthly Magazine* for April 1949 there is a most interesting contribution by Dr Moore, of the Dyson Perrins Laboratory at Oxford, on the use of a plastic sheet known as "xylonite" for the mounting of insects as an alternative to Bristol Board. Dr Moore has examined and experimented with a number of different types of plastic sheet and finds xylonite F9665 the most satisfactory. It is a matt-surfaced ivory-white material about 20/1000 inch thick, and the advantages claimed over Bristol Board are as follows:—

- (a) High degree of permanency.
- (b) No tendency for mounts to swing on the pin.
- (c) Freedom from glare, giving better definition under the microscope.
- (d) No tendency to stain.

Having used and experimented with "xylonite" myself I can add the following advantages:—

(a) Absolutely no tendency to buckle. This means that the tragacanth gum can be put on liberally.

(b) The gum does not dry so rapidly so that more time can be spent setting an awkward or very small insect.

(c) It can be used along-side Bristol Board mounts without looking odd. There is no need to remount specimens in order to present a uniform appearance in the cabinet.

This material is actually cheaper than Bristol Board. A sheet costing 9s is 55 by 24 inches, and can be obtained from the General Celluloid Co. Ltd., 206 Hanworth Road, Hounslow, Middlesex.

There are disadvantages (but in my opinion they are far outweighed by the advantages), namely:—

(a) The sheet can not be cut by means of a razor blade and some form of photograph print trimmer is essential.

(b) It is rather hard to get the pin through the mount and a hole has to be started for the pin, with a strong needle of slightly less diameter than the pin.

Although we all like neat and careful mounting, which so much enhances the appearance of the collection, I have always felt that too much time is spent on the orthodox methods of labelling, etc. For many of us the time available for entomological work at home is limited and the writing of data labels or even filling in partly printed ones is an unprofitable waste of time compared with the careful examination and identification of specimens.

Indian ink can be used very satisfactorily on xylonite and I write a number in the bottom right hand corner of the mount and keep a book record. The number can be written on the underside of the mount if preferred, but the beetle has then to be lifted from the box or drawer to read it.

The advantage of a book record is that in one line of writing against the number in the book, one can record locality, data, collector, habi-

tat and additional data too voluminous for a small label. The saving of time when dealing with a number of beetles (or other insects) from one locality is enormous, as, of course, only one entry is necessary for all the insects collected at one place on the same date.

Many entomologists are of the opinion that an insect is of no scientific value unless it has its data on the same pin. As there are all sorts of scientific and other specimens in museums and private collections which do not have their data directly attached to them, but rely on catalogued data, I cannot see the force of this argument. If insects so numbered are sent in exchange or for identification, it is a simple matter to attach a label from data written in the book record.

As one who has limited time to spend on working on the collection at home, I have tried to devise methods for saving time in mounting and arranging. After all, the examination and identification of the "catch" is the real worthwhile job and the more time spent on that the better.

L. S. WHICHER (1345).

[Will any member take up the challenge?—Ed.)

ON KILLING AGENTS FOR LEPIDOPTERA

I note that in Dr H. Henstock's recent very useful articles on substances for killing insects (*Bull.* 98, p. 9, and 99, p. 16) no mention is made of one which I always employ, with much success.

This is ethyl acetate* ($\text{CH}_3\text{COOC}_2\text{H}_5$)—a colourless, mobile and volatile liquid. The vapour is inflammable and has rather a pleasant fruity smell, though it should not be inhaled too freely. My killing bottle consists of a wide-necked jar to the bottom of which a pad of cotton wool is fixed. A small quantity of the liquid E.A. is poured on to the pad, the bottle is *firmly corked*, and is then ready for use. An insect placed in the bottle soon becomes still and is dead in a very short time. No wing colours are ever affected, in my own experience, and specimens are in a perfectly relaxed condition after killing. One or two species become very stiff and are then difficult to relax if left too long in the killing bottle. As the bottle is repeatedly opened in the field to admit the captures as they are taken, it is wise to carry a small

phial or bottle of liquid E.A. on collecting expeditions, so that the bottle can be quickly recharged if necessary. I should imagine ethyl acetate to be easily as efficient as chloroform or carbon tetrachloride, as a killing agent, with about the same advantages and disadvantages as these two substances.

As regards the use of ammonia, the white crystalline carbonate is more convenient for use in the field. A convenient killing bottle can be made up by pressing some crystals of this solid into the bottom of a suitable jar, and covering them securely with cotton wool or dry blotting paper. As the unstable solid gradually decomposes, free ammonia gas is evolved. The killing bottle is thus efficient for a much longer time without recharging, than one charged with the ".880" liquid ammonia. I have, however, long given up using ammonia, in any form, as a killing agent. Not only does it turn greens into a dirty yellow, but black becomes dark-brown, and reds and browns are darkened and very much dulled. It is very suitable for "micros" on account of the relaxed condition in which specimens remain after killing with it.

In his "Hints to Collectors," Part I, the late Mr L. W. Newman recommends the use of petrol for killing Burnet Moths (*Zygaenidae*). The method is to drop the moths, as caught, into half a jar of clean petrol. They are killed almost immediately and on placing on blotting paper the petrol is absorbed and evaporates leaving the specimens stiff but in perfect condition. They are easily relaxed by means of a laurel box or some other type of relaxing tin. Cyanide is useless for killing Burnets as they are not dead for over an hour after placing in the killing bottle. I am told, however, that benzene (C_6H_6) is suitable for killing Burnets and other insects in the same way as petrol.

There is, of course, always the old "stabbing" method of killing green moths which employs oxalic acid as the killing agent. A needle is dipped in a concentrated solution of this white crystalline substance in water, and then jabbed into the thorax of the insect, which has been previously stupefied in chloroform or some other agent. The procedure is rather risky since it may

damage the specimen, and it requires considerable practice. Ethyl acetate is much to be preferred for killing both green moths and *Bur-nets*.

TERENCE PARSONS (1513).

Editorial Note:—This article was received before the publication of Dr Henstock's description of ethyl acetate in *Bulletin* 102, p. 37.

TETRACHLORETHANE

Having read the notes on tetrachlorethane in *Bulletins* 94 and 100, I have tried it as a killing agent for Hymenoptera. I find it considerably slower than ethyl acetate, nor does it leave the specimens so well relaxed. In some cases it seems to affect the wings of the insects, rendering them yellowish or whitish in colour.

I do not find it readily absorbed by plaster of Paris—if more than a few drops are used the sides of the bottle become covered with condensation. It is, however, readily taken up by cork and given off very slowly. Some small tubes, the corks of which accidentally became contaminated, remained lethal for several weeks.

I have no trouble in using ethyl acetate, either by means of slips of paper dipped into the liquid and introduced into the small tubes in which I bring back my specimens from the field, or by absorbing the liquid on plugs of sponge rubber or chips of celluloid at the bottom of a bottle or tube. With both these methods, specimens can safely be left in the tube or bottle for a week or more. I do not know, however, how this would affect Lepidoptera.

P. W. E. CURRIE (977).

POTASSIUM CYANIDE

Concerning Dr Henstock's "Disadvantage" in using potassium cyanide for killing insects (*Bull.* 98, p. 9), I used cyanide for several years, until "converted" to tetrachlorethane. I found that insects removed from the cyanide bottle to an air-tight tin with enough room to allow for the free diffusion of gases within, but maintaining a sufficiently moist atmosphere, soon became quite limp. The conventional relaxing tin may be used instead. But success depends to a great extent on the time taken: they *can* be left too long in either type of tin.

PETER G. TAYLOR (719).

LAUREL LEAVES

In recent articles in the *Bulletin* I have read that some members do not appreciate "laurel leaves" as a killing agent. Actually I use *nothing else* now, and have tried most things except ethyl acetate. Most leave the insect very stiff and difficult to set. I have kept insects in the killing pot for over six months and still found them easy to set, especially Coleoptera. I often catch insects in match-boxes and put the whole lot into the killing pot. I always leave insects 24 hours in the pot before setting. They do not get excited as with other killing agents and have time to empty their alimentary canal, preventing later putrefaction.

I leave Lepidoptera on the setting boards at least a month to prevent springing, which I find very difficult to put right once it's happened.

I write this from my experience, and hope it will help others.

NIGEL J. AUSTIN (966).

A USE FOR WAXED CARTONS

Household commodities such as honey or balsams are frequently contained in waxed cartons which have screw-on tops. When the contents are finished these can easily be converted into handy containers for larvae met with in the field or on holiday (when one's usual resources may be far away). The only thing to be constructed is a gauze inner lid which fixes firmly, but is easily removed.

Take a length of wire, stiff but springy, just more than enough to fit the inner circumference of the carton and turn up the ends at right angles to the level of the circle, and bending slightly inwards. There should be a gap in the circle which can be closed when the two upstanding ends are pressed between finger and thumb.

To fit the gauze to the wire ring, first temporarily close the gap by a few twists of wire round the uprights; then lay the wire on to a square of netting of suitable size and sew with strong thread over and over the wire. When finished, undo the uprights and the resulting spring-back will give a taut gauze. This "lid" can be inserted into the carton by nipping the uprights and letting them spring back into position under the interior rim.

Diagram 1.

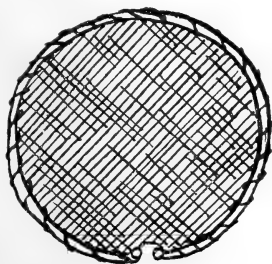


Diagram 2.

Diagram 1 shows the inner lid in position horizontally with the up-ribs released and pointing upwards. Diagram 2 shows the "plan" of the wire with gauze sewn on.

W. J. B. CROTCH (1181).

THE SOUTHERN AESHNA AND ITS NEW LOOK

(Continued from p. 52)

At about eight o'clock on a June evening I found the first *cyanea* of the season. It was clinging, newly emerged and still "wet," from its discarded nymph-case, the legs of which still firmly grasped a clump of stonecrop overhanging my brother's little ornamental pond. The angular hindwings revealed that it was a male (the same members are rounded in the female). And, by way of digression, what a wealth of "ready-made" material these little ponds house, even in the heart of a town! "It (the newly-emerged insect) is the sort of thing I'd never think of looking out for," quoth my

brother—thereby aptly summing up a state of affairs in which many a hidden wonder remains hidden merely because it is never "looked out for." This miniature pool, I found, was literally swarming with the carnivorous water-beetle, *Dytiscus marginalis*, a ruthless gangster of the subaqueous world—and, incidentally, a strong flyer to boot—to which nothing in the way of a prospective meal comes amiss. With this notorious murderer about it was fortunate for my brother that he had not restocked his pond with fish: for the insatiable rapacity of *Dytiscus* is such that, in experiments, it has been known to continue to devour its prey even though itself dying; while that grand and observant naturalist, Frank Buckland, has given us, in one of his excellent books, a vivid idea of the depredations that the six-legged bandit may wreak among the fry of fish, including salmon. This pool, incidentally, also contained scores of newts, and earlier this year I found many exuviae of those two well-known dragon-flies, *Libellula quadrimaculata* and *L. depressa*, to say nothing of diverse other natural history specimens.

To get back to *cyanea*. With leaf-like wings still tightly folded and body curved in an almost complete S, at this stage the whole of the insect, including the wings, conveyed an impression of yellow-green freshness remarkably in harmony with the lush verdure surrounding it. Small wonder that the average non-naturalist should fail to glimpse even so large an insect (mature specimens of which may measure three inches in length) while still thus perfectly attuned to its environment.

Being reluctant to miss the fascinating spectacle afforded by the development of a specimen of one of our finest dragonflies towards the final state, I very carefully extracted the cluster of stonecrop to which the nymph-case was attached, and just as cautiously placed it, with case and dragon-fly still dangling, in a roomy jar, the lid of which I clipped down over a small portion of the plant left protruding. On arriving home I found the insect clinging independently to the lid; from this he was transferred to a bunch of foliage on a window-ledge.

Immediately the light was switched on my dragon-fly essayed his first short flyer—to the lamp-shade. Here

he rested for some time, until, at about 10.30 p.m., the wings were suddenly extended, and he crawled still closer to the electric bulb, the heat and light from which were evidently very welcome. An hour later the customary drops of fluid were ejected; by this time, too, the body hues had already deepened considerably.

Reluctantly I went to bed. In the morning, accompanied by my small daughter—a promising naturalist if ever there was one—who insisted on perching the dragon-fly on her finger, I went into the garden. The finger was extended towards a convenient hedge—but our *cyanea* would have none of it: he was impatient to set out on his first real flight. With a sudden lift he took off, hovered for a moment above our heads, then sped away—not in a horizontal plane, but upwards, flying almost vertically towards the sky. Within a second or two he was beyond the roof-tops, and the last our straining eyes saw of him was a tiny dark cross, still climbing but now at a steadily decreasing angle, outlined beneath the soft greyiness of the morning clouds.

PETER MICHAEL (748).

ABSTRACT

In a letter to *Nature* (Vol. 163, p. 255, February 12, 1949) Dr Dora Ilse (1575) notes the results of experiments she has made on **Colour Discrimination in the Drone Fly, *Eristalis tenax***. It is the first time that a solitary insect of the *Diptera* has been successfully trained to colours. *Eristalis*, caught feeding on yellow flowers, quickly learned to find their food on models cut out of a yellow paper. By mixing this yellow paper and two other shades of yellow with shades of grey paper in the proportion of one to five, it was found that the trained flies paid 105 visits to the coloured paper against 11 to the grey paper. Thus it was colour and not the degree of lightness which attracted the flies. Other experiments showed the flies discriminated between yellow and other colours and between shades of yellow and shades of blue. Unfinished experiments on training the insects to blue seemed to show that some training must have been involved. It is hoped that

Eristalis may prove a suitable subject for the study of its colour-discrimination.

REVIEWS

Butterfly Lives, by S. Beaufoy, with a preface by E. B. Ford, F.R.S. 128 pp. and over 190 half-tone plates from photographs. Published by Collins, St James Place, London, 1947; price, 12/6.

Although it is some two years since the publication of this beautiful book, it has not been previously reviewed in these pages. A reviewer seems generally to be cast in the rôle of critic, correcting errors, pointing out misprints. It would, however, be an impertinence for any reviewer to criticise the photographs with which this book is so generously illustrated, unless he were the author's peer in insect photography. There are few, if any, such experts in this country. Suffice to say that not only are the pictures lovely, but they are presented in order to show something and not merely because they are beautiful photographs.

In the text, there is clear evidence, all the way through, of that first-hand knowledge which is so much more interesting to the reader than a compilation of what has been said by others. The life-histories are written in a simple, anecdotal style, but have, nevertheless, all the brevity and clarity of scientific observations. The text was read by Dr E. B. Ford before publication, a sufficient criterion of its accuracy. Only one misprint was noticed which will doubtless already have been noted by the author. This is a book which is "well worth the money"; in every way it is a book of distinction.

T. T.

Les Naturalistes Belges, Tome xxx. No. 1: 10 francs. This periodical is published monthly and contains items of general (including entomological) interest. This number contains an article on the Tineid *Tegeticula*, which pollinates the Yucca flower, and several entomological questions are answered in "Le Courrier des Naturalistes." The Editor will lend the number to any member interested.

AES PUBLICATIONS

LABEL LIST (3/6) and **Check List** (1/6) of **British Lepidoptera** (together 4/3). **Label List of British Butterflies** (4d). **The Hymenopterist's Handbook** (7/10). [To non-members, 10/10]. **Experiments with Bees** (AES Leaflet No. 10, recently published), 7d each; 5/- per dozen.

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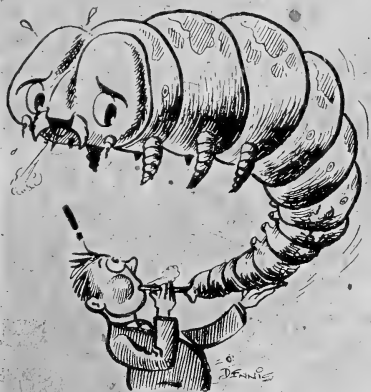
Silkmoth Rearer's Handbook. Data for the revised issue to: **W. J. B. CROUCH**, 5b Stanley Crescent, London W.11.

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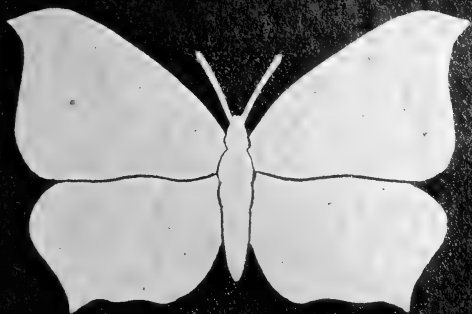


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No. 105

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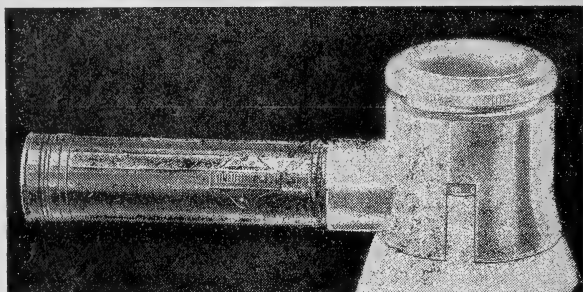


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No. 105

BULLETIN

SEPTEMBER 1949

THE PRIZE-WINNING ESSAY

"MY BEST DAY IN THE FIELD"

May 16th 1948 was a bright cloudless day. Sparrows fluttered and chirped in the first rays of the morning sun. Cycling was easy as a slight breeze gave me its help. I was heading towards the North Downs for a place between Leatherhead and Dorking.

After happily leaving the suburbs of London, I reached Oxshott, a little hamlet south of Esher, and I prepared for beating out the Oak Eggar. Half an hour passed without success. All that I disturbed were some Orange Underwings, which I disturbed by some birch trees by the edge of the heath. I remounted my bicycle and pedalled vigorously off.

After passing Leatherhead, and then Box Hill, I approached—after great struggles at pushing my bike uphill—a little village called Ranmore. I stopped in a typical Surrey lane and caught a male pygmy Orange Tip which had been flying by the side of a ditch.

I padlocked my bike a little further along the lane under the shade of two extremely large yew trees and walked out. I took out my net and wandered along the lane in the full glare of the late morning sun. A mated pair of Pearl Bordered Fritillaries fluttered lazily across the lane and disappeared behind some bushes. I took up the chase, thinking of the good time I would have breeding this Fritillary. I did not catch them so I continued wandering along the lane.

By some stunted brown bracken two Brown Arguses frolicked in the sun. I caught them—and immediately saw my favourite Hairstreak—the Green Hairstreak. Once more I took up the chase, and after falling over some stones I captured joyfully my first Green Hairstreak, but it was not in good condition, as its wings were very slightly worn, but it was late in the season for this species. I had gone a fair way down the lane and it was mid-day, so I turned back to my bicycle with the

intention of having my lunch and then going on to the downs. I made my way lazily through the woods and now and then disturbing a butterfly, which was usually a Pearl Bordered Fritillary at rest on the top surface of a leaf. I passed through a green ride shaded by tall trees bowing in their splendour, and entered a green glade where, in one corner was a very dark Pearl Bordered Fritillary basking in the sun. I caught it with a downward sweep of my net, and looking into it I saw a very dark Pearl Bordered Fritillary in very good condition. This was a piece of luck as all the other Pearl Bordered Fritillaries out at this time were very worn. I reached my bicycle and sat down to eat cheese sandwiches, and all the time was annoyed by flies buzzing around my face.

I finished my lunch and cycled on towards the village, stopping there for a refreshing drink at the village tea shop. I crossed over the road, padlocked my bike, climbed over the stile and jumped onto the soft turf of the downward slopes. The field was carpeted with flowers, chiefly the common buttercup. I walked down to the bottom of the slope, which was a little way from the railway. Here, five- and six-spot burnets were very abundant. I got over the railing which divided the two fields and entered a chalky field lying fallow. Along the sides of the field were hedges bordered with elms. I chased a Burnet (with its spots run together) and caught it. Later on I caught some more Burnets and soon had a fine series of them.

I walked along by the side of the railway and caught another Green Hairstreak, in fairly good condition, which had been resting on a briar. I was lucky to see it, as its wings were closed and the dusty green undersides of its wings looked just like a leaf of the briar. I followed the path beside the railway and entered another field with many buttercups. The male Adonis blues flitted around flowers while the females rested in convenient spots. I captured four females and four males; all were in good condition. I made my way

back to my bicycle, stopping now and then to catch a variety of Dingy Skippers and other species

I reached my bicycle and had my tea, looking out across those glorious Downs. I finished my tea and mounted my bicycle and headed for home, my chief thought being upon a hot bath and my bed.

RICHARD LUDLAM (1519*).

PAIRING MOTHS IN CAPTIVITY

In view of correspondence in the *Bulletin* (Vol. 7, pp. 13, 27, 131, 148, 207) on this subject, members may be interested in a device which I have used now for several years and which has proved very successful in obtaining males for newly emerged females of the heavier species, the females of which fly little before pairing.

I have made a roomy cage with sides of gauze, about 12" square, and have let into one side an open-ended cone of stiff smooth paper with the small end pointing inwards, thus making a trap on the lobster-pot principle. The inside of the cone, that is, the side facing outwards from the trap, is roughened by pasting gauze on to the paper, to enable a moth outside to crawl up to the opening; the side of the cone which is inside the trap is left smooth. The aperture at the small end of the cone is about 2" in diameter. The floor is hinged and opens downwards. (See Fig. 1).

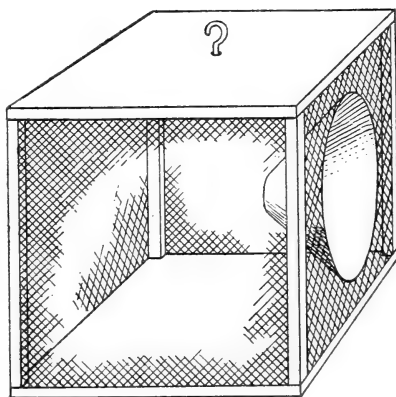


Fig. 1.

Exact details of dimensions and method of construction are probably unimportant. My first one was "lashed up" in twenty minutes from

a disused gauze cage originally supplied by Newman of Bexley and it was successful within a few hours.

I put the newly-emerged female, to act as "bait," into the trap, which I then hang from a tree in the garden and leave. It is surprising how often a male will make his way into the trap and be found in the morning paired with the female. The trap does not always work at once, and during May (1949) I had a female Poplar Hawk remain motionless in the trap for nine days and then attract a male into the trap on the tenth night.

This method has succeeded with Privet Hawk, Poplar Hawk, Eyed Hawk, Puss Moth, and Buff Tip, each of them a number of times. It failed with one Elephant Hawk I have had; in that instance the female managed to escape, but that is the only female I have lost.

Also, avoid leaving the trap outside, during the daytime (unless it is to attract day-flies). This morning (25/5/49) I had a pair of *L. populi* in my trap, and this evening nothing was there but two detached wings. I can only suppose a tit had found his way in—and out again. I imagine this would be quite a simple problem for a tit, which knows how to get at the milk in our early morning milk bottles.

My house is in Maidstone, with allotments and parkland adjoining the garden.

L. S. BEAUFOY (628).

INSECT ORDERS

(Continued from Vol. 7, p. 209)

Order VII

ISOPTERA (*Termites*)

These are the most highly socialised of any insects. They live in vast communities composed of numbers of specialised individuals or castes. The workers are the neuter forms of both male and female, and in this important respect they differ from the social *Hymenoptera*, where the workers are sterile females only.

Termites consist of four main castes. (1) Winged sexual forms; the purpose of these is to migrate from the parent colony and so spread the species. On starting a new colony the wings are shed. (2) Sexual forms with nymphal wings and the reproductive organs not so well developed as in (1); it seems likely that these individuals are present only in order

to take over, should the queen meet with an accident. (3) Workers; these are sterile and wingless individuals of both sexes. (4) Soldiers; these are sterile individuals of both sexes, in which the head and mandibles are greatly enlarged, and in some a poisonous secretion is produced. Their purpose is the defence of the colony.

A termite colony consists of the queen and her attendant king, workers, soldiers, winged forms and nymphs. In some cases there may be several kings and queens.

The mouthparts of termites are of the biting type and bear a general resemblance to those of the *Orthoptera*. Their food consists of wood and vegetable material and the gut is full of symbiotic protozoa which digest such material. Some species cultivate fungi. Nests may be either aerial (some Australian nests are 12-20 feet in height), subterranean, or else they may be in a piece of rotten or dry wood. They bore tunnels throughout the interior of the wood without making their presence known at the surface. It is these species that cause such destruction to buildings and posts in certain parts of the tropics.

The queen is very prolific and her size increases with age. Up to 4000 eggs a day have been recorded, but this is probably exceptional. In general the rate of egg-laying is proportional to the size of the colony. All newly hatched nymphs are externally similar and they differentiate into their castes during growth, the workers changing least of all. Development is slow and may be two years with the sexual forms, and is shortest in the workers. From five to nine instars occur.

Termites are classified into three Families as follows:—

(1) **Mastotermitidae.** The tarsi are five-jointed and an anal lobe is present in the hindwing. Inhabitants of Australia.

(2) **Calotermitidae.** Tarsi four-jointed. No anal lobe present in hindwings. The soldiers usually possess compound eyes and the mandibles are dentated.

(3) **Termitidae.** Tarsi four-jointed. No anal lobe present in hindwings. Soldiers without compound eyes or dentate mandibles.

Termites are very common in the Tropics and occur in most temperate regions. There are two European species, *Calotermes flavicollis* and

Leucotermes lucifugus, but these do not extend their range to the British Isles, though they may be kept in captivity.

(To be continued)

BRIAN O. C. GARDINER (225).

MOTHS IN MINES

Reading the excellent article on the "Invertebrate Fauna of a Coal Mine" (*Bulletin* 103, p. 48), it occurred to me that Terence Parsons (1513) and others interested might like to know that moths also turn up in mines. In *Common British Moths* (1918), A. M. Stewart records the result of an entomological hunt in an ironstone mine on a March morning, at the invitation of miners who claimed to have seen 'butterflies' in the pit. The insects were there sure enough — "not butterflies, which, of course, I did not expect to find, but moths fluttering along the 'roof' (i.e., of the stables), which was but a few inches above our heads. We did not need a net, and in a minute a specimen was in the box. It proved to be a fine, normally-developed specimen of the Hay moth (*C. quadripunctata*) . . . There were plenty of the moths, and . . . they were to be found in the mine nearly all the year round . . . due, probably, to the fairly high and steady temperature."

As the author pointed out, their presence was not difficult to account for, since the larva of the Hay moth (= Pale Mottled Willow, *Caradrina clavipalpis*) feeds on hay, and there was hay in abundance in the stables; "doubtless the eggs . . . had been transferred to the mine with the hay." Also found were "two or three specimens of *Tineae*," which came from the beams of the stables.

PETER MICHAEL (748).

NOTES AND OBSERVATIONS

RONALD S. NORTH (654) reports taking a Striped Hawk Moth (*C. livornica*) on valerian at dusk on June 20th 1949, at Aylesbury, Bucks. He has, in four years, caught forty-seven species of butterflies within a radius of 20 miles of Aylesbury. Among the less common ones were the Purple Emperor, White Admiral, Wood White, Essex Skipper and the five Hairstreaks. Favourable factors are chalk hills and very old oak woods in the district. He has observed one or two remarkable changes

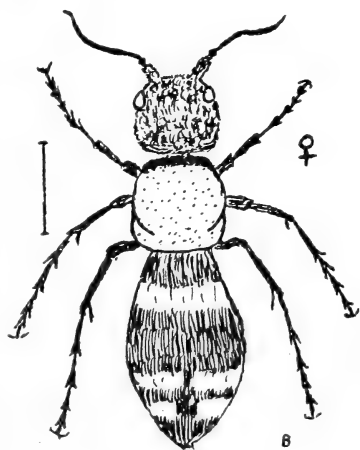
in distribution over the last thirty years; notably, the Comma and White Admiral were hardly ever seen in the early years but both are quite common now, at times.

CAPTAIN T. DANNREUTHER (60), commenting on the above, says that so far this year (June 27th) there have been nine records of the Striped Hawk Moth, including Mr North's. There may be a dozen or so more as the continued drought in Spain would favour an extension to the British Isles. It attacks vines when the wayside weeds are dried up. This occurred in 1943 — the great *livornica* year—when 497 wild moths and 87 bred moths were recorded: over 200 were from St Mawes, in Cornwall, alone, between May 27th and June 28th.

CAPTAIN DANNREUTHER also reports (on 27th June) that *A. atropos* was first recorded on May 31st and that the season looked about normal, with *V. cardui* preponderating over *V. atalanta*. The Clouded Yellow's furthest north was Middlesbrough on June 12th.

COMMON OR RARE?

While collecting in North Devon this Spring I took a female *Mutilla europaea*. A brief description may be of interest to some members. *M. europaea* is a wasp that is parasitic on *Bombidae*. The male has wings but the female is wingless. I will describe the female only as I have not seen a male to date.



It is approximately 12 mm. long and a very agile runner. The legs are black and the middle and hind legs

have a spine on the inside of the tibia. The antennae are black and rather pointed. The head is entirely black. The thorax is reddish-brown with the exception of a black band near the head; it also has two indentations toward the abdomen. The abdomen is black and has one complete band of yellow hairs just below the thorax and two broken bands near the tip. The female is armed with a sting which is approximately 2 mm. long.

How common or rare is this insect? What is its distribution?

B. L. J. BYERLEY (788).

THE SPREAD OF SPECIES WITH WINGLESS FEMALES

It is a reasonable possibility that the wingless condition of the female is a degenerate one, and that both sexes once possessed wings, enabling an original distribution over a wide area.

Smaller scale distribution could be brought about by means of the young larvae. Young hairy larvae, and even smooth-skinned larvae by spinning a silk strand, might be blown considerable distances by the wind. Fully-fed larvae when they get the 'wander-lust' can travel quite a distance so this factor must not be overlooked. I have never seen a pair of moths flying *in cop.*, and I should imagine that this would be a difficult process for the male of a wingless female species—the female being so much heavier by comparison.

BARBARA HOPKINS (827).

MATING FLIGHT AND WINTERING OF CLOUDED YELLOW

In August 1941, at Freshfield, Lancs., I watched the mating flight of a pair of Clouded Yellows (*Colias croceus*). They met; one (I could not see which) followed the other into a tumbling somersaulting flight similar to that executed by almost any pair of "Whites" (*Pieris spp.*) on meeting and then, quite suddenly, the "dance" changed to a tightly, ecstatically gyrating, whirling conical spiral, till the pair had climbed to about 20 feet above the floor of the hollow in the sand-dunes in which they met.

Then, one (again I could not see which, for the speed) broke away suddenly, and, followed by the other, came hurtling down to settle, trembling and quivering, under an overhanging tussock of grass. There

ensued a short period of comparative quiescence, when the female lay with her wings depressed and quivering, and her abdomen upraised, while the male stood by, fluttering his wings slightly. He then advanced on the female, turned about, and applied the tip of his abdomen to hers. The whole dance lasted about three minutes, and a few seconds later, both participants were safely boxed up (together).

I kept the female for about three weeks, by feeding her on sugar solution, uncoiling her proboscis with a pin, although I had never heard of this method before (being 14 and a "lone ranger"). During this time I could not induce her to lay a single egg, although "potted up" with red clover.

At the end of the three weeks, much to my dismay, I dropped her while feeding her, between the bathroom runaway pipe and the floorboards.

Next April (1942), although there was over a foot of snow during the winter, and the crevice in which she was open to the out-side air, I came home from school one morning to find repairs in progress to the bathroom runaway pipe, and there, on the ground outside, amidst all the dirt and mortar, my little Clouded Yellow, alive! I nearly wept for joy.

PETER G. TAYLOR (719).

MITES ON BUTTERFLIES AND BEETLES

Articles published in recent *Bulletins* (No. 102 and No. 104) have apparently, revived interest in this subject. ALAN P. MAJOR (1117) now reports that a Cockchafer (*Melolontha* sp.), which flew in at his window (about May 17th), had seven or eight whitish-brown mites which kept running in and out from under its wing-cases. Also on June 5th on Queen Down Warren, near Rainham, he saw a *Sinodendron cylindricum* beetle with several small whitish-brown mites on it, mainly near the head. H. K. AIRY SHAW (545) thinks the Lamellicornia are particularly subject to mites. It is, of course, common to find species of *Geotrupes* and *Aphodius* with a large number of mites on their under-surface, but he thought these merely acted as scavengers, "cleaning up" these dung-feeding beetles. He has never seen them on *Melolontha*, *Amphimallon* or *Phyllopertha*, nor on

any of the *Lucanidae*. Mr E. Browning, of the British Museum (Natural History), to whom this question was referred, writes that he had not been able to turn up records of mites on cockchafers. A number of species of mites, especially larval and nymphal forms, are to be encountered on insects; it is one of the means of distribution of mites, for a number in this transportation stage do not feed.

PETER G. TAYLOR (719) found that about 70% of the Marbled Whites (*M. galathea*) which he examined in July 1945 were suffering from what was, evidently, a bright red, almost 'pillar-box' red, mite. He never saw any segmental appendages in those he pulled off and suspects that he merely removed the mite's abdomen (*opisthosoma*) leaving the business end within. They always occurred on the soft membranes between segments or sclerites; the external, visible portion varied very considerably in size, some being up to $1\frac{1}{2}$ mm. in diameter. He thought they *might* not be mites at all, but fungous bodies (cf. *Saprolegnia* on fishes).

C. DOWN (59) recalls that, in company with the late Dr W. G. Nash and the late Mr F. Remington, when collecting on Royston Heath in 1922 and 1924, he caught *L. coridon* with bright red parasites attached to their bodies. Some were so much covered that their flight was impeded and some were seen on the ground exhausted. These also were covered with mites. A note was published about that time in one of the entomological journals, naming the parasite.

(The Editor regrets he has not yet been able to trace this note—perhaps a member can help.)

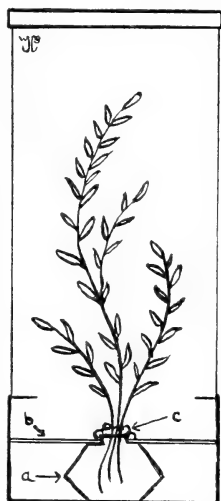
REARING YOUNG LARVAE

Ova near hatching should be placed in a glass-topped tin the bottom of which has been covered with one layer of clean blotting paper, kept slightly moist. This will do for the newly-hatched larvae for a day or two: but because the small caterpillars tend to descend from a horizontal food-plant to rest and thus come into contact with frass, it is better for them to "graduate" as early as possible to a cylinder cage, where larger sprays can be provided for them. These will probably not need renewal till after the larvae have passed safely through the very

critical first moult. The sprays must therefore be kept in water and this gives rise to two dangers: that the larvae may drown themselves and that they may fall off and be unable to regain the foodplant.

The accompanying diagram indicates how the major risks can be overcome. Use one of those inkbottles which can be stood at various angles (indicated by *a*); this gives good water-capacity with low height. Cut a circle of cardboard (*b*) of radius sufficient to fit snugly into the lower part of the cylinder and round the neck of the bottle. Surround the stems of the food-plant with cellulose wool (*c*) and see that it spreads out and on to the cardboard "floor." This will enable any caterpillars which fall off to climb back. Ordinary cotton wool would be likely to entangle them: cellulose wool can equally easily be obtained from a chemist.

W. J. B. CROTCH (1181).



ANOTHER TYPE OF LARVA CAGE

L. G. F. WADDINGTON (169) writes: "I should like to amplify my previous note a little (*Bulletin* 102, p. 39). Fundamentally, I always aim at apparatus which combines efficiency with simplicity of both construction and operation. I eschew over-elaboration or Heath Robinson ideas.

"Potting up plants is anathema to me, as my limited time requires to be devoted to rearing larvae and not to horticulture. Other disadvantages are:—

(1) The sleeve has to be opened to see how they are getting on, which is a waste of time.

(2) Larvae might drop down on the soil when removing the sleeve and so get lost.

(3) They might get trapped in the folds of the sleeve and fail to reach the foodplant.

(4) The question of support is a time-wasting nuisance.

(5) Many foodplants do not lend themselves to potting up or to being sleeved.

"An additional advantage for the hurricane-lamp-glass cage is that many larvae, particularly of the larger sort, can be tipped into the glass as soon as hatched; but I frequently adopt the more usual method of rearing to the first instar in a glass-topped tin. Here, again, I can register an improvement. I drill a one-eighth inch hole just below the edge of the lid on the side of the box and put a small spray of the food-plant with a fairly long stalk through the hole (packed with cotton wool, if necessary), and stand the tin on edge over water in a glass meat jar. Later on, I transfer the larvae to the lamp-glass cage. To cover up this hole for field work, when not engaged in larvae rearing, I use a small square of insulating tape, which is readily detached and stuck on another part of the tin when reverting once more to the function of rearing." He adds that, in making the cap, if the first strip of ivory board (*ibid.*, p. 40) is cut so that there is the merest fraction of a gap and then tied round with cotton, the cap will be a dead fit. He uses butter muslin for covering the cap.

Miss BARBARA HOPKINS (827), replying to L. G. F. Waddington's (169) note (*Bulletin* 102, p. 39), says:—"The method I described is used at Rothamsted for rearing large numbers of test insects (mostly Noctuid larvae) and is the quickest, simplest and most effective method we have yet discovered. On the plants I have used up to now the bags did not require support. Of course, all plants cannot be potted up and this restricts the technique to some extent, but nettles (dead and stinging) and docks thrive in pots and require watering only occasionally. There is no substitute for the growing plant, especially for larvae. When larvae are of a size to handle, cut foliage is all right, but

with young larvae it deteriorates before it is eaten, necessitating transference on to new food. With the bag technique, fresh growing food is available for the hungry larvae. Fewer larvae are lost through losing their way off the food as the bag fits snugly over the leaf. The conditions are healthy as a constant supply of air is passing through the bag and frass dries as soon as it is formed. There are no damp droppings to harbour disease germs. I think both techniques are good, but for different types of rearing—Mr Waddington's for breeding a few and observing them; mine for breeding a lot in the quickest healthiest way."

BEEKEEPING IN ESSEX

The *Seventh Annual Report* of the Essex Beekeepers' Association, describing weather conditions in the 1948 season and their relation to the honey harvest has just been sent me by Henry C. Mills (1228), its author. The statistics quoted are of interest to all beekeepers, and it would be instructive to compare them with those from other areas. Of special interest are the following items:—

The largest supply of nectar during this strangest of seasons was provided by fruit blossom, followed by hawthorn, both being available early in the season when foraging conditions were good. Later in the season blackberry yielded well, coming third on the list. Fourth, and a long way behind, came white clover, but in many places it was very poor. In the seed-growing areas, *Brassica* seed crops yielded well. Elsewhere, the use of hormone weedkillers seemed to have been most successful in eliminating charlock, which used to provide much nectar. At Wivenhoe, bees gave far more attention to fields of lavender (grown for oil) than they usually do, and pickers complained that they had never before collected so many stings at their work. The Sea Lavender (*Limonium*) was found a good source of supply in coastal areas.

On July 18th, a 3-4 days old virgin queen was observed to make several flights at intervals of five minutes, finally returning on the last flight after an absence from the hive lasting fifteen minutes, with obvious signs of mating. On the same occasion, another virgin queen, 22-23 days old was seen acting in a similar way, returning duly mated after an

absence of twenty minutes from the hive.

The number of queen cells built by a colony preparing to swarm varies greatly; at Leyton, 43 were counted on one frame, and a total of over a hundred was found in one hive.

Human thieves were the worst danger to beehives in several places. A bad case of poisoning by arsenical spraying was recorded at Chelmsford, confirmed by analysis at Rothamsted, in May, which greatly reduced the strength of all colonies in the apiary.

It is well known that grasses, being wind-pollinated and producing no nectar, rarely interest honeybees, but two observers, in the early mornings of several days, watched bees industriously gathering cream-coloured pollen from cocksfoot. The bees hung on to the drooping flowers with their front legs, gathering the pollen with their middle legs and passing it to the pollen baskets on the hind legs. At Birdbrook, bees were observed working vigorously on the flowers of Kelvedon Wonder pea during three or four days. A very careful observer at Leigh-on-Sea watched bees gathering both pollen and nectar from buttercups on May 14th and 15th; contrary to superstition, there were no ill effects among the bees during the following few weeks. (I can confirm this observation from my own experience, in North Riding, about a month later, when nectar was collected during the warmer part of the day, pollen early on; my bees thrived admirably that year, 1946).

B. A. COOPER (19).

18/3/49.



"Quick! Where's the book on beekeeping?"

ABSTRACT

A New Type of Killing Bottle, by Henri Raizenne. Canadian Department of Agriculture, Division of Entomology, Processed Publications No. 31—revised June 1948.

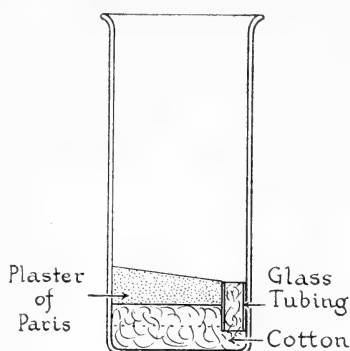


Fig. 1.

The author thinks that carbon tetrachloride and ethyl acetate have certain distinct advantages over potassium cyanide. They kill insects without undue hardening or distortion of the tissues and do not bleach the colours, being specially useful for green Lepidoptera. They are miscible with water and are generally used by diluting with equal parts of water. Since 1943 a specially designed killing bottle has been used successfully at the Forest Insect Survey Laboratory at Ottawa.

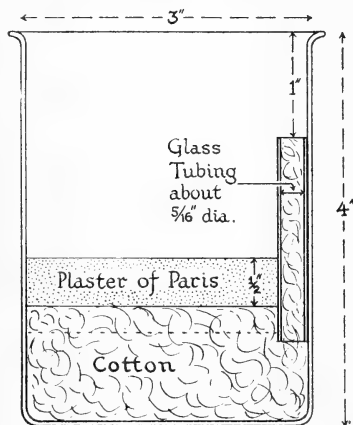


Fig. 2.

The two figures give details and are to the scale of $\frac{1}{2}$ inch equals 1". The glass tubing is glued to the side of the containers. The cotton is absorbent cotton wool and in the bottle type (Fig. 1) the plaster of Paris is squeezed carefully out of a medicine dropper to form a platform a shade

higher than the top of the glass tube. It should be allowed to set at a slight slope to the opening of the tube.

To use the bottle type (Fig. 1) squirt about 2.5 cc. of ethyl acetate on to the plaster of Paris and allow to run into the absorbent cotton. With the jar type (Fig. 2) introduce about the same amount of ethyl acetate into the tube, and insert a small plug of cotton wool in the mouth of the tube to prevent too rapid evaporation and small insects dropping in. Replenish every two weeks. Clean by washing with soap and water and allow to dry thoroughly before refilling. Keep away from direct sunlight to prevent condensation of moisture on the sides.

(Note:—The glass tubing in Fig. 2 should not be shown filled with cotton wool.)

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These are attractively got up paper-backed small books of thirty to forty pages, well-illustrated by photographs or line drawings, or both. They are all of general interest, but No. 6, *Aquatic Insects*, is likely to prove most interesting to AES members. In the first chapter, there is a useful tip for preventing the water becoming foul, when carnivorous insects are kept in small containers, and stress is laid on the importance of keeping a notebook for on-the-spot observations. Other chapters deal with Water Beetles, Water Bugs, Dragonflies, May Flies, Stone and Alder Flies, and Caddis Flies, with two final chapters on Aquatic Moths and Flies with Aquatic Larvae. The reviewer was rather amused to note that the cover illustration appeared to be an enlarged, but reversed, copy of the picture on p. 19.

T. T.

AES PUBLICATIONS

LABEL LIST (3/6) and **Check List** (1/6) of British Lepidoptera (together 4/3). **Label List of British Butterflies** (4d). **The Hymenopterist's Handbook** (7/10). [To non-members, 10/10]. **Experiments with Bees** (AES Leaflet No. 10, recently published), 7d each; 5/- per dozen.

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VOL. 8

No. 106

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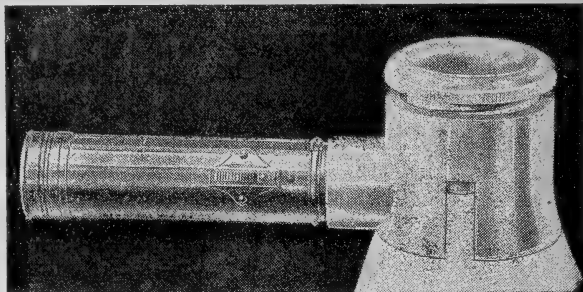


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No. 106

BULLETIN

OCTOBER 1949

EDITORIAL

About this time, the cover for Volume 7 and its Index will be in the hands of members. The Editor undertook rather lightheartedly the compilation of the Index; he can, now, fully appreciate the labour which R. V. Aldridge (262) put into the compilation of the Index to Volume 6. P. G. Taylor (719) checked and proof-read with the utmost care, and the Honorary Secretary, S. M. Hanson (320) did his share. The Editor offers his whole-hearted thanks to these gentlemen and takes full responsibility for any mistakes. It is hoped that the Index for Volume 8 will be issued with the December *Bulletin*. It will differ from the Volume 7 Index—it must, for example, be more simple, as no one has much leisure for the labour involved in checking and cross-checking. If, however, any member has any ideas which he would like to see incorporated in this Index and feels sufficiently strongly about them to write to the Editor *within the next ten days*, his letter will be given fullest consideration.

DEGREASING

I am sure that all members who are collectors of Lepidoptera experience the trouble caused by grease. My method to overcome this difficulty when it occurs is either to cut off the abdomen and soak it in methylated spirits, or, if the wings are affected, immerse the whole insect. I do not think that this method is always satisfactory, as I find that sometimes it makes the colour of the wings lighter.

I should like to read how other members deal with this trouble.

W. J. MEAD (1578).

L. G. WADDINGTON (169) in a note headed "The Perfect Degreasing Agent" (*Bulletin* No. 91, p. 193), gives an account of "trichlorethylene" as a degreasing agent. For the benefit of new members, this is reproduced below. The Editor would be glad to hear the experiences of

other members either with trichlorethylene or other new solvents.

THE PERFECT DEGREASING AGENT

I think I have made a really useful discovery which will be of great value to collectors: I think I have at last found the best degreasing agent, namely trichlorethylene.

I purchased a quantity to get rid of the tar deposit in the tank of a car I had bought; it was a failure as such; but in a series of experiments on greasy moths I found it quick and, so far as I can tell, absolutely effective: it has benzene, petrol, ether, chloroform and Fullers' earth whacked to a frazzle; it is also relatively cheap—1/6 a pound from Boots. Immerse the insect for 4-5 hours, pin in a slight draught and it is dry in five minutes, unstained and fresh looking.

Bathe in it and it will take all the fat from your marrow.

It has revolutionised all my *Non-agria typhae* (Bulrush Wainscot).

L. G. F. WADDINGTON (169).

COLLECTING IN SOUTH AFRICA

Collecting in this country is an interesting business. The fauna is, of course, very varied, and very variable in different localities. Although I am specialising in the *Membracidae*, and making a personal collection of Homoptera generally, I am now taking almost anything I come across as material for exchange for *Membracidae* of the world. On my three weeks' holiday recently I took over 2500 specimens, which kept me very busy "papering." I have devised a new method of packing insects for exchange as I decided the old methods were unsatisfactory. If insects are "papered" in envelopes or tubes they are very liable to shake about and become damaged, and if placed on cotton wool they become entangled in it. So I now lay them on paper wool or tailors' padding on card and wrap them in cellophane, clipping it in place with staples. This, I find, is much more satisfactory, as they do

not shake about and different groups can be packed separately, and so are easily sorted when required.

I have also found that a haversack is a nuisance when collecting, as it always seems to slip round in front at the wrong moment. So I bought a white boiler suit and converted it into a 'Bug suit' by adding about a dozen pockets, in which all that is required can be carried. This, with a pair of leggings and tackie-boots, completes my outfit. I do not suggest that it would be suitable for collecting in England (where it would attract a good deal of notice and comment!), but it is very suitable for conditions in South Africa. In some localities ticks are a pest, especially the very small ones, which are much smaller than the head of an entomological pin. These, apart from the irritation induced by their bites, can also cause "Tick fever," which is very unpleasant while it lasts. I find that comparatively few are able to find a lodgement when this "Bug suit" is worn in conjunction with leggings, which are also a protection against snakes, although those usually make their escape as one approaches.

Another innovation of mine is a collecting 'bag-bottle.' This is a small linen bag about six inches long, the neck of which is fixed to a metal tube of about 1½" diameter by a strong rubber band. Tapes attached to the neck of the bag enable it to be tied to the belt. A bung is fitted to the mouth of the tube. It is particularly useful for collecting beetles, which cling to the bag and can be taken home alive and killed all together with boiling water.

The most remunerative methods of collecting here seem to be beating and sweeping, depending on the locality and time of year, and, of course, the type of insects one is seeking.

A. L. CAPENER (6).

SILK MOTH NOTES

The longest life quoted in the *Silkmoth Rearer's Handbook* for an unpaired female is sixteen days. Members may accordingly be interested in the fact that a female *Antheraea mylitta* (the Tussock Silk Moth) which emerged on 30th June lived until the evening of 23rd July. Most evenings after the 10th, when she became active, she was taken out of her cage and allowed to fly around indoors. Several evenings

she laid a dozen or so eggs upon my hand!

Have any amateur breeders noticed the rage of nearly grown *Actias selene* (Indian Moon Moth) larvae when disturbed? If tickled on the side with a brush to speed them off one twig on to another, they will twist round upon themselves with great force, fiercely gnashing their mouth-parts and producing a clearly audible clicking sound, rather like the crackling of small electric sparks one gets from brushing one's hair.

Thirdly, a curious hereditary weakness has been noted in the larvae from one pairing of *Philosamia cynthia* this year. While being normal though sluggish in the first two instars, they were seen to fall to the ground after their second moults. Close examination showed that they were without as many as eight of their claspers, some being rudimentary, some without trace. One had rudimentary true legs as well. Needless to say they survived no further.

I should like to receive further notes and comments on these, or other, silk moth phenomena.

W. J. B. CROUCH (1181).

A REPLY TO "AN IDEAL SPOT"

I have just read Mrs W. M. Le Fleming Forbes' article "An Ideal Spot" (*Bulletin* 104, p. 58) and can reassure her that there are such spots in the South.

I live in S.E. London (the Borough of Woolwich) and in that area we have two moderately sized woods, one to the east of the Borough and the other to the south; both are less than 1½ miles from the heart of the town.

In the wood to the east, 325 species of Macrolepidoptera have been recorded officially by myself (in *British Woodlands*, St John Marriott, published by Routledge and Co. 1925) and this list has been added to in the last few years. The other wood to the south on high ground I have not fully listed yet but to date 379 have been listed. So in this suburb of London alone, about one third of the British Macrolepidoptera occur. I am not going to suggest that all these species swarm there, but they are regular in appearance and do not include any of the rare migrants, such as the Death's Head Hawk, the Striped

Hawk or the *Convolvulus* Hawk, all of which have occurred in the district from time to time.

As regards sugaring, six moths, on an average, at each patch, I would consider poor. Twenty to thirty would be average, and on several occasions I have had fifty or more to a patch. One good night a friend and I counted on six trees the following numbers:—114, 91, 87, 84, 73. True, they were mostly common species, but there were some good things among them, and on this particular night, my sugaring mixture consisted of golden syrup with a drop of rum added. There is not really much in the statement about the sugaring mixture, but as I hope to make this the subject of a future article, I will not enlarge on that.

I can think of places within easy reach of London by bus or Southern Electric where Mrs Forbes could take all the butterfly species she mentions (with the exception of the Large Heath, *C. tullia*), with the Purple Emperor, the Wood White and the White Admiral thrown in for good balance.

To our members I would say "Seek and ye shall find," and if he (or she) works one area consistently, within easy reach of his home, he will have some pleasant surprises, which only the South can give.

CHARLES H. HARDS (176).

HYBRID BLUES

Mr Parsons' article in the June *Bulletin* (No. 102, p. 37) is of much interest. It appears to be generally accepted that the form named *polonus* is a hybrid between *L. coridon* and *L. bellargus* and may be found in June-July and again in September. In an article I contributed to the *Entomologist* in December 1944, I gave details of a number of examples recorded by various collectors with dates and localities. To these should be added seven male and one possible female examples taken by the late General B. H. Cooke in the Dolomites during June and July 1926, and recorded in the *Entomologist* in Vol. 60. These latter were exhibited at a Meeting of the Royal Entomological Society when the general conclusion arrived at was that the insects were hybrid *coridon-bellargus*. In 1917 at Gomshall I took a male *bellargus*

in cop. with a female *coridon* and also a male *icarus* paired with a female *coridon*. I experimented with the latter pair and as a result obtained a number of ova which duly produced larvae. Unfortunately owing to absence on holiday I was unable to give them the necessary attention and on my return I found the lino enclosing the larvae badly torn (probably by a bird) and the cage empty. Pickett also recorded a male *icarus* taken in cop. with a female *coridon* at Royston in the *Entomologist's Record* Vol. 29.

I have an example with undoubted *icarus* forewings and *bellargus* hindwings (of the var. *punctata* form, i.e., with a complete row of black spots on each side) taken by myself at Folkestone.

A considerable number of illicit pairings have been recorded from time to time, some being very extraordinary, as, for examples, a male *M. jurtina* paired with a female *A. paphia*, two male *paphia* paired and very small species paired with much larger ones. The greatest offender to the moral code is *M. jurtina* which seems to be most often found in copula with other species. I see no reason why some of these illegitimate connections should not produce fertile ova, and I suggest that collectors who meet with them should experiment and endeavour to get ova.

S. G. CASTLE RUSSELL (119).

NOTES AND OBSERVATIONS

MISS BARBARA HOPKINS (827) had, in a batch of about 50 Privet Hawks (*S. ligustri*), two larvae of an unusual colour. These had purple largely replacing the green ground colour between the white diagonal stripes; the narrow purple edging to the stripes had spread beyond its usual limits. Buckler (*Larvae of British Butterflies and Moths*, Vol. II, Plate 22) figures a larva, which he calls "of unusual colouration," which is similar to these, but of a more extreme form, as the three thoracic segments are also purple. The very dark, almost black, marks in Buckler's figure were smaller and less sharply defined in Miss Hopkins' larvae.

PAUL H. HOLLOWAY (429) writes on August 1st, 1949: "While examining lavender bloom after dark last evening I netted what appeared at a casual glance to be a Geometer

on one of the flowerheads. On indoor inspection, however, it proved to be a Common Blue male (*P. icarus*). When released from the net, the butterfly proceeded to fly round the lamp in typical moth style."

R. S. GEORGE (1402) records that he noted five Hummingbird Hawk moths feeding at Viper's Bugloss flowers on the Prince's Golf Course at Sandwich on July 7th, 1949.

CORRESPONDENCE

THE EDITOR, *AES Bulletin*

Dear Sir, — In reply to Mr Whicher's article (*Bulletin* 104, p. 60) I am in complete agreement. I am not a coleopterist, but even so, in labelling Lepidoptera much time is wasted by useless fancy mounting. We are, I assume, a scientific body and not an artistic one. True, we must have neat and orderly collections, but even so, the length to which some people go in search of artistic or other useless touches is appalling.

In the case of my insects, I merely place a number on a small slip of paper under each insect and catalogue the data. This is a quicker way, incidentally, of obtaining any given specimen. It also saves eye-strain in writing on a card minute words which, like as not, if you are no sign writer, are unintelligible anyway. I suppose that most of us keep collections for identification purposes and to record results of breeding, and as most of us have little time for a complicated or fancy layout we are better for keeping our objects in mind—the study of entomology from the standpoint of the field rather than the collection. Yours, etc.,

J. B. OGDEN (1580).

11/8/49.

FIRST IMPRESSIONS OF LEPIDOPTERA COLLECTING IN SOUTH AFRICA

I came to South Africa by air in April last year, and I think there may be some other members who might like to know something of butterfly collecting out here.

The journey out took me via the Belgian Congo, and I naturally had high hopes of catching some tropical Lepidoptera. I was unlucky: although we spent a night at Leopoldville, all I saw was a most

unwholesome cockroach two inches long and myriads of mayflies and mosquitoes. The following day we touched down at Elizabethville for lunch, but we were only there for 1½ hours. I managed to get a look at the borders of the airstrip and I had the chance to examine one of these massive anthills of which we have all seen pictures. I was also able to catch two butterflies (*Terias butleri* Trim. and *Acraea calderena* Hewitson), but they were neither big nor brilliant.

I arrived next day in Johannesburg and came straight from there to Cape Town.

On arrival in Cape Town, I made tracks to a second-hand bookshop in order to see what literature was available concerning South African Lepidoptera. I was shown the three volumes of Trimen's *Butterflies of South Africa* which were priced at £10 10/-. This was beyond the reach of my pocket so I had to do without. I then contacted the other Cape Town AES member, who very kindly offered to identify my specimens. Since then I have learned that a fellow enthusiast is worth a whole library of text books.

Compared to England the existing literature relating to South African Lepidoptera is very poor indeed. The standard work is Trimen, but besides being very expensive and almost unobtainable, it is very out of date, having been published in 1887. Few life histories, etc., are given and, indeed, to-day there are still many which are unknown. A more recent publication is one by D. F. Murray (1935), which deals with the *Lycaenidae* only. Besides these there are also the monumental volumes of Dr Seitz, but these are also expensive and very difficult to obtain. As far as moths are concerned the position is even worse, the only books available relating to them are Seitz (which only covers the *Sphingidae* and *Bombycidae*) and *South African Moths* by J. T. Janse. Up to date only four volumes of this work have been published. To my way of thinking the moths are not tackled in a very scientific order. Dr Janse begins with the *Geometridae* and *Sematuridae* followed by some of the *Noctuae* and then plunges into micros. The descriptions are extremely technical and are really based on genitalia: this is all well and good, but not of

much use to a field entomologist who is more concerned with identifying specimens without having to resort to a microscope. I know that the identification of some moths is only certain by genitalia, but surely this should only be used when the means of wing patterns, etc., fail? The illustrations are very poor, too, being ordinary black and white photographs, and it would seem well nigh impossible to identify any moth from these. Very little is known here really about the moths, many have yet to be named and described, and perhaps a greater number discovered. I personally think that the ground work of naming the species and working out their life histories should be entered upon before the technical details. In a country like this where there are more general entomologists than highly specialised ones, a book concerned with the species from an amateur's point of view would be more acceptable to the nature-loving public.

(To be continued.)

A. M. HOLMES (1198).

“SECOND-YEAR” PRIVET HAWKS

Two of my Privet Hawks recently emerged after two winters spent as pupae; and here, briefly, are the details, which should be of interest to lepidopterists who have not yet bred *Sphinx ligustri* as well as those who have not had pupae that carried over to the second year.

Of seven eggs deposited by a wild female captured on 25/6/46, six hatched and five larvae survived. The first went below for pupation on 19/8/46, and all had “dug in” by 24/8/46. One pupa, subjected to considerable “forcing” (frosting, etc., as well as heating), yielded an imago on 5/4/47; moth number two—a female—emerged on 11/6/47, and subsequently laid about a hundred eggs—sterile, of course.

No further emergence took place during 1947, but the remaining pupae were tested from time to time, and found to be alive and healthy. Imago number three (♀) put in an appearance during the evening of 26/6/48, being followed by a fourth (♂) the following morning. The fifth moth has yet to emerge.

In connection with these “second-year” imagines, one or two interest-

ing points, *inter alia*, seem worth noting:—

- (i) Individuals of the same brood do not necessarily emerge in the same year, i.e., the phenomenon forming the subject of these notes is not automatically applicable to complete broods.
- (ii) Both sexes are involved.
- (iii) Even after so long a pupal period as two years, pupal emergence times may approximate as closely as in first-year emergence.

Tyros are probably apt to get careless and become impatient when a certain number of insects fail to emerge in the year following pupation: I suspect some throw out the chrysalids, deeming them N.B.G. Those breeders should possess their souls in patience and keep their pupae a further year; they need only inspect the jars or cages at intervals and, if they feel so inclined, test the chrysalids periodically. Incidentally, Privet Hawk pupae invariably react strongly to light; so that testing is an easy matter.

My insects were kept outside, in a semi-sheltered site (open loggia). No attempt was made to ensure humidity over and above that supplied in the normal way by the weather, and in each case the bulk of the material furnished for pupation was fine sand.

South (revised version) seems to give the impression that second-year emergence in the case of *S. ligustri* is very rare: only two authentic cases are mentioned. I doubt if the phenomenon is so infrequent as his book suggests; it seems more likely that breeders do not bother to record it when it occurs, or that, as I have already stated, the experiment is seldom carried to its rightful climax.

PETER MICHAEL (748).

THOSE WERE THE DAYS

Browsing through the pages of the *Entomologist* of 1875, the impression gathered is of an entomologists' Golden Age—with a superabundance of insects. One fortunate enough to collect in those days was Gervase F. Mathew, R.N., who seems to have been as successful with his beating tray as the Reverend Joseph Greene was with his trowel.

On the 25th of March 1874, he spent an evening sallowing near Dartmouth. English names alone have been added. He writes:— "After dinner, at half-past seven, I left the ship again for the sallows. By this time the weather had changed, a thick fog having rolled in from the sea; but as it was still very mild, with scarcely a breath of wind blowing, I considered it a favourable night, for these damp warm evenings are invariably the best. On reaching the first sallow (one growing in a small clearing in an oak wood), lighting my lantern and throwing its gleams on the bush, a sight met my gaze which I have never experienced during the whole course of my entomological career. The blossoms were actually swarming with moths, and hundreds of others fluttered round struggling for a meal! On nearly every flower there were at least three moths; and the fresh arrivals, crowding on to those who had already partaken too freely, dislodged them, and they fell helplessly to the ground below, but appeared soon to recover, for I noticed them in numbers crawling up the branches in quest of another meal. This host of moths was composed chiefly of *Taeniocampa cruda* (Small Quaker), although *T. miniosa* (Blossom Underwing), *T. munda* (Twin-Spotted Quaker), *T. rubricosa* (Red Chestnut), *T. gothica* (Hebrew Character), and *T. stabilis* (Common Quaker) were present; besides *Hopiorina croceago* (Orange Upper Wing), *Xylocampa lithoriza* (Early Grey), *Cerastis vaccinii* (The Chestnut), *Eupithecia abbreviata* (Brindled Pug), *E. exigua* (Mottled Pug), *E. pumilata* (Double-Striped Pug), and *Hybernia progemmaria* (Dotted Border). I took one of Mr Bignell's beating-trays with me and upon beating the bush the effect was perfectly marvellous, the sheet and the ground around it being literally covered with moths; and a plentiful supply of them were deposited on my head and shoulders. As soon as they began to recover they flew in such crowds around my lantern as almost to obscure it, and once or twice actually succeeded in getting inside and extinguishing the light.

"Coleoptera were represented by numerous specimens of *Dryops femorata*, which I believe was formerly considered rare. Hymenoptera were not absent, for *Bombus terres-*

tris (Garden Bumblebee) had taken up its quarters for the night amidst the downy anthers of the flowers.

"Several *Taeniocampa cruda* fell on to my sheet in the clutches of a pallid-hued spider, and on a log of wood I saw a centipede busily occupied sucking the juices of another, doubtless captured whilst in a state of unconsciousness.

"The next evening was bright and mild, but with a strong breeze from the north-west, but . . . *T. cruda* was just as abundant as on the previous evening and *T. miniosa* considerably increased in numbers. *H. croceago* and *T. munda* put in an appearance again; but my grandest capture was a fine *Dasyampa rubiginea* (Dotted Chestnut)."

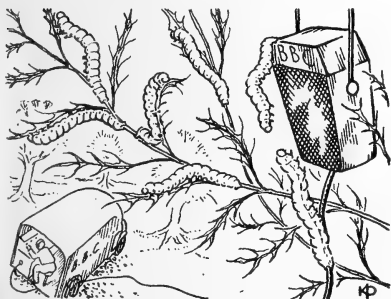
Two years before, on the 28th of June 1872, Mr Mathew ". . . went with my friends, Messrs Bignell, Bishop, Gatcombe and Jones, for a farewell entomological ramble in the woods of Bickleigh Vale (Plymouth) . . ." and was again rewarded with an overflowing beating tray.

"The woods, at the point where we entered them, were composed chiefly of young pollard oaks, with here and there a few birch and buckthorn bushes, and in the whole course of my entomological career, I never saw such a sight as presented itself to our astonished gaze when we first plunged into this wood. In many places large patches of oak were literally stripped of every leaf, and innumerable larvae were to be seen wandering over the branches in search of food. If we stood still and listened we could plainly hear the jaws of this countless host at work as they were ravenously feeding, and their frass dropping on the dead leaves below sounded like falling hail. We soon commenced beating, but it was fearful work, every blow of the stick bringing quarts of larvae into our calico trays (a most ingenious invention of Mr Bignell's) and as we walked we could not avoid treading on larvae crawling on the ground, and were soon covered with them ourselves. The four most abundant species were *Taeniocampa stabilis*, *Hybernia defoliaria* (Mottled Umber), *Oporabia diluta* (November Moth), and *Cheimatobia brumata* (Winter Moth); but occasionally we got something a little better, for in a little while Mr Bignell's cheery voice rang out— 'Hullo, here's something good! Surely not *chaonia*? Yes, it

is, though; and a beauty too!' This raised our hopes and the bushes were thawed more vigorously than before; and presently Mr Gatcombe exclaimed that he had a lovely *ridens*. I afterwards took one or two crawling about the bare branches in a most forlorn manner, as they had evidently been eaten out of house and home. We continued beating and obtained about three dozen each of *Notodonta chaonia* (Lunar Marbled Brown) and *Cymatophora ridens* (Frosted Green); and in addition larvae of *Thecla quercus* (Purple Hairstreak), *Demas coryli* (Nut-Tree Tussock), *Taeniocampa miniosa*, *Hoporina croceago*, *Himera pennaria* (Feathered Thorn), *Crocalis elinguaris* (Scalloped Oak), many other common species, and few unknown to us, and we returned to Plymouth, much pleased with our day's outing."—(From *The Entomologist*, No. 138, pp. 12 and 99.)

They may well have been pleased—but the astonishing thing seems to be not the abundance of the larvae, but the amount of noise they seemed capable of producing—if only the BBC had existed in those days, what an excellent opportunity for an outside broadcast!

K. H. POOLE (1933).



PUBLICATIONS RECEIVED

The Editor has received the following publications:—

- (1) *Handbooks for the Identification of British Insects*.
 - (a) Vol. I, Pt. 5, *Dermaptera and Orthoptera*, by W. D. Hincks, 3/6.
 - (b) Vol. I, Pt. 10, *Odonata*, by Lt.-Col. F. C. Fraser, I.M.S., 7/6.

- (c) Vol. IX, Pt. 1, *Diptera* 1. Introduction and Key to Families, by H. Oldroyd, 7/6.

These are published by the Royal Entomological Society of London and the Editor hopes that reviews will appear in the November *Bulletin*.

- (2) *Hardy Reptiles and Amphibians*, by G. L. Payne. Water Life Series No. 2, 1/6. Published by "Water Life," Dorset House, Stamford St., London, S.E.1.
This is a further booklet in the series noted in *Bulletin* No. 105, p. 72.

- (3) *The School Nature Study Journal*, No. 176, Vol. 44.

See *Bulletin* No. 103, p. 56.

ABSTRACT

The Macrolepidoptera of the Moor-gate, London, Bombed Sites. By D. F. Owen (1930). *The Entomologist*, Vol. LXXXI, March 1949, pp. 59-62.

After the rubble of wrecked buildings had been cleared away, plants, followed by birds and insects, soon appeared. This paper gives the results of studies on the Lepidoptera made to the end of 1948. When a new species arrives, it increases rapidly, until the hymenopterous and dipterous parasites find it out, when the numbers are reduced to normal again. *Deilephila elpenor*, for example, appeared on the rose-bay willow herb in great numbers, but in 1946 70% of the larvae were parasitised by diptera, and by 1948 numbers were about normal for a countryside habitat.

Of particular species, the butterflies do not appear to be quite so common as some of the Hawk moths. Only one Comma was observed, one Holly Blue and one Large Skipper. The Lime and Eyed Hawks were reasonably common as was the Elephant Hawk. A list is given of the moths which have been noted either as larvae, pupae or imagines. Twenty-nine kinds are mentioned, some of which are reported as "very common" or "swarming." A curious observation was made of a full-grown *Spilosoma lutea* larva eating a hole in a fairly soft pupa of the same species and apparently sucking out some of the liquid content.

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Subscriptions, 1947	335 16 2	Postage	70 18 4
Subscriptions, 1948	10 0 0	Advertising	8 17 0
Publications	128 8 0	Stationery	49 17 9
Donations	66 13 3	Meetings	7 4 6
Postage	5 6 8	Outward Subscriptions	12 13 6
Advertising	3 14 4	Advances to Officers, less refunds	6 9 4
Stationery	38 16 11	Balance at Bank, 31.12.47	326 19 11
Meetings	5 8 7		
	<u>£789 3 6</u>		<u>£789 3 6</u>

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Stock, 1.1.47	£217 4 4	Donations	66 13 3
Purchases	472 3 2		
	<u>£689 7 6</u>		
Less: Sales	£128 8 0		
Stock, 31.12.47	305 0 7		
	<u>433 8 7</u>		
	<u>£255 18 11</u>		
Stationery:			
Stock, 1.1.47	£41 9 0		
Purchases	48 11 9		
	<u>£90 0 9</u>		
Less: Sales	£38 16 11		
Stock, 31.12.47	27 11 0		
	<u>66 7 11</u>		
	<u>23 12 10</u>		
Postages	60 12 5		
Meetings	1 15 11		
Outward Subscriptions	12 13 6		
Advertising	3 0 8		
	<u>£357 14 3</u>		
Balance Income over Expenditure transferred to Balance Sheet	104 2 10		
	<u>£461 17 1</u>		<u>£461 17 1</u>

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Subscriptions paid in advance	17 10 0	C. B. Pratt	0 13 0
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Balance from 1947	104 2 10	Stock valued at cost:	
	<u>412 18 7</u>	Publications	£305 0 7
	<u>£680 8 7</u>	Stationery	27 11 0
			<u>332 11 7</u>
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Silkmoth Reamer's Handbook. Data for the revised issue to: **W. J. B. CROUCH**, 5b Stanley Crescent, London W.11.

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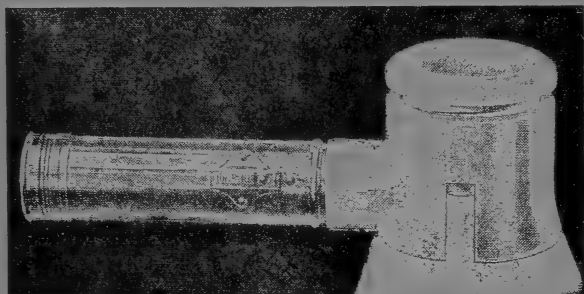
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EDITORIAL

The Editor's call for copy at the beginning of September had a heartening response. Old friends rallied round and promising new talent was disclosed. Moreover, there was evidence of much goodwill. The Editor thanks everyone most gratefully. He hopes other members, also, will strive, during the coming winter, to describe their experiences for our edification and instruction. It is most difficult to write a short article, packed with information, where every word counts and none is redundant. Try it!

PROGRESS

It is some time since a note appeared in these pages on the membership of the Society, and we are sure members will be interested to know that we are making good healthy growth.

The increase in membership during 1948 was 50, and this year to Sept. 23rd, 81 members, making the total number as follows:—

Senior	...	...	704
Junior	...	...	168
Affiliated	...	...	27
Honorary	...	...	5
Total	...	...	904

The figure 904 will need some explanation to members who recall a total of 1,071 members given in *Bulletin* No. 90, Feb. 1948. During 1946-7 the membership grew rapidly from 654 to 1,071 but officers of the Society had great difficulty, owing to pressure of other work, in keeping things going. By the end of 1948 the Society had managed to re-organize to deal with the increased membership, and it was found that a number of members had not paid their subscription. After due warning these members were omitted from the membership list. The total accumulation of defaulters over these years was 346.

S. M. HANSON,
Organizer and Secretary.
B. L. J. BYERLEY,
Address Indexer.

INVERTEBRATE FAUNA OF A
COAL-MINE

I was indeed interested to read Peter Michael's note on the occurrence of moths in an ironstone mine (*Bulletin* 105, p. 67). I had heard of similar experiences before, but not in our local coal-mines. The note prompts me to make some inquiries here, however, and if anything turns up I shall record it in these pages.

Apart from one or two further specimens of *Acanthocinus aedilis* and a number of mature and immature males and females of *Periplaneta americana*, I have received no new insects from the mines; but possibly there are small insects underground which are certain to be overlooked by the miners, particularly those insects of secretive habits.

One interesting fact has, however, come to light. The cockroaches occur only in the warmest, and, therefore, the deepest parts of the underground workings. They are never found in the same places as the Longicorn beetles, which occur only in the cooler parts of the mine, chiefly near the base of the shaft. This illustrates at once that the cockroaches, being native to tropical America, and the Longicorn beetles, being indigenous to Scandinavia, and other parts of northern Europe (cool temperate climate), migrate to the warmest and coolest parts of the mine respectively; that is, to those parts where the temperature is more nearly that of their respective indigenous climates. It might be interesting to determine the highest temperature which the beetles tolerate and the lowest temperature which the cockroaches tolerate in the mine workings. I agree that the almost constant temperature in most parts of the mine results in insects occurring all the year round, irrespective of season. I have had *A. aedilis* in March, June, July, August, and December, and have been told by the miners of their occurrence in almost every month.

TERENCE PARSONS (1513).

HOMEOSIS

Among a number of High Brown Fritillaries (*Argynnis cydippe*) I

caught on July 2nd in Hertfordshire was a slightly undersized male in quite good condition showing a perfect example of homeosis.

The pattern of the underside of the lower half of the left forewing is reproduced over the pattern of the lower half of the left hindwing (see Ford's *Butterflies*, p. 229, para. 1).

It may also be worth recording that in 1947 I took 4 examples of the Dark Green Fritillary (*A. aglaia*), which were pale straw colour—almost white—with the usual markings, three on July 6th and one a week later. All appear to be males; unfortunately they are not in first class condition.

ERIC W. GRAHAM (1142).

THE STEM-FEEDING MOTHS

No. 1. THE BUTTERBUR

(*Hydroecia petasitis*).

This species is far more common in many places in Northern England than is generally realised. In two districts particularly studied in the West Riding, one out of every three plants of the butterbur was found to contain a larva. The fact that the plant completely covers some areas hundreds of yards square, means that the population of larvae is very appreciable.

The ova are deposited in autumn and the young larvae may be found during spring the following year. At the end of April the young larva is about half an inch long and is then in the stem of the larger leaves of the butterbur. By mid-May it eats its way through the stem and into the "heart" of the plant where the young leaves are forming. This becomes its headquarters for most of its remaining larval growth. First it eats out completely the young rolled leaves and the presence of the larva may always be detected by the fact that the outer leaf of the heart goes a dirty brown in colour; also a fair amount of frass surrounds it. Only one larva per plant is ever found at this stage, though whether this is because there was only one egg laid per plant or to later selection I cannot say as yet. Having eaten all the centre leaves, the larva eats down into the root-stock. It may be found in the top two or three inches of the root, just below the affected heart, until it is fully grown about mid-June.

The moth comes out in late July and the season, for this district at least, is over by the first week in August.

The following notes may assist in collecting and rearing. The larva is

best collected at the end of May. The stems of the leaves should be cut some three inches from the base. Dig down about three or four inches and cut through the root. This leaves you some eight inches of plant made up half of stem and half of root. About half a dozen of these stems (each containing one larva) may be planted in a ten-inch pot containing six inches of earth. The pot should be covered with a gauze or muslin cover. No other attention is necessary except a little watering once a week. The larva, being almost fully grown when collected, will promptly feed up, burrow deeply in the earth and duly hatch about July 20th.

W. E. COLLINSON (247).

A PARASITIC BEETLE

I first became interested in the parasites and scavengers of wasps' nests through my friend B. J. L. Byerley (788). It was on Saturday, Aug. 13, 1949, that I joined him in his search for the parasitic beetle, *Metoeus paradoxus*.

We went to Batchworth Heath to dig out a wasps' nest that we had noted earlier in the year. Besides the usual collecting apparatus, we took with us a large-size biscuit tin, a bee-keeper's veil and a pair of gloves each. From the farmer on whose land the nest was situated, we borrowed a large trenching tool, a spade and a hay-skewer (like a giant meat-skewer, 3-4 feet long).

On making our way to the nest we saw the Clouded Yellow flying quite commonly over oat stubble which had been undersown with clover. About 18 specimens, in perfect condition, were noted. With still a short distance to go we came across another wasps' nest, the entrance of which was under some very prickly black-thorn bushes.

From a pipette we squirted into the entrance hole about 20 c.c. of ethyl acetate and plugged the entrance with a clod of earth. While this was taking effect we proceeded to the other nest and treated it in a similar manner. We then returned to the first nest, donned our veils and gloves, took the hay-skewer and probed the ground for the exact position of the nest. Having found it we dug right in, but owing to the awkwardness of the site were not successful in getting it out whole. As we were removing the nest a male *Metoeus paradoxus* flew out and was lost. One was taken by uncapping the cells. We then proceeded

to the second nest which was situated in a bank; with this we had more success. By careful digging we managed to remove the nest whole. From this we took eight specimens of *M. paradoxus*, two of which were immature; these were found by uncapping the cells. While examining the nest many dipterous larvae were found, which I tried to rear. I kept these in tins 5" in dia. by 2" deep; in the bottom was placed a half-inch layer of peat, over this three pebbles were spaced to support a portion of the bottom layer of the nest.

Unfortunately these larvae have either disappeared or died.

CAN ANY MEMBER HELP ME WITH SUGGESTIONS FOR REARING THESE DIPTEROUS LARVAE?

FRANK L. HATCHER (1441).

A.E.S. references to *Metoeccus paradoxus*.

Bulletin, No. 100, p. 20. By K. C. Durrant (1375).

Bulletin, No. 104, p. 58. By B. J. L. Byerley (788).

CATERPILLARS OF THE DOTTED CARPET

In the deep valleys of West Somerset the larvae of the Dotted Carpet (*Alcis jubata*) can be beaten, very locally, in spring and early summer from the long hairy lichens on a number of different trees—sallow, hazel, oak, hawthorn and sloe; I have one note of it from birch, and from the abundant, heavily lichened beeches it can hardly be absent, though on the rare occasions when I beat beech I did not find it. The active little bluish-green larvae grow very slowly and are badly ichneumonated (something like 50 per cent), but they are easy enough to breed, and pupate in moss. Having no experience of lichen-feeders, and being impressed by what I had read of the necessity of keeping the lichen damp, I damped it every other day and changed it frequently, but I have no idea how far this was really necessary, and certainly the lichen growing on the trees seemed the hardest, most unpalatable stuff. Perhaps some other member can enlighten me.

F. H. LYON (1026).

THE VESTAL MOTH

On 28th August (1949), at dusk, I captured a male and female of this moth (*Rhodometra sacraria*) in a stubble field not far from my home at

Plymstock, South Devon (3 miles east of Plymouth). Between that date and the time of writing (2nd Sept.), thirty-four specimens have been examined, ten of which have proved to be females. I firmly believe that the area contains quite a number which I have not yet discovered.

The field concerned, on a limestone outcrop, some 250 ft. above sea-level, and three miles from the sea in a direct line, yielded an early crop of barley and had been undersown with clover. As soon as the cereal was cut, large areas of the field became overgrown with white campion (*Lychnis alba*) and field scabious (*Scabiosa arvensis*) together with many annual weeds of various species. This has made it an excellent hunting ground for moths. I found that there was one certain method of discovering Vestals and that was to examine all the flowering heads of field scabious. Here, like little paper triangles, the moths would spend considerable periods probing the florets for nectar. I have seen no less than three Vestals on one head and they have still been there half an hour later, their long tongues thrusting busily here and there. They were quite unmoved by my use of a strong light to examine them closely. In fact they seem to be neutral to light, only one specimen reacting markedly; this moth which I had disturbed flew straight into the flame and singed itself. It is very interesting to compare this record of Vestals visiting flower heads, with the experience of D. F. Owen (1330) in his report contained in *Bulletin* 92 (June/July 1948). During the day, I found that these moths had to be beaten out before they would fly, and this they would do for no more than a few feet. Even in darkness, only short, low flights were made, although one which had been alarmed by a near-miss with the net, made a sustained flight the whole length of the field, but eventually seemed to weaken so that it came down within range once more.

On the one night recently that could be classed as stormy, I found that these moths were not averse from forsaking their usual resting places among the barley stalks, and several had adopted more sheltered perches high up in the surrounding hedges. Even in these circumstances, however, I found that they had not left that part of the field where scabious was most plentiful, although this was the most exposed. A vast number of Silver Y moths (*Plusia gamma*) share

the field with the Vestals—yet another point which has some connection with that made by Mr Owen.

Eight females have been caged. They have accepted captivity quite phlegmatically, feeding avidly on sugar-water and ovipositing at night upon the netting front of the box, in spite of a varied supply of growing plants. So far at least 150 eggs have been counted. There may be many more. These are sausage shaped, about 1 mm. long, and pearly white for the first 36-48 hours. After this period they turn a deep rose pink. Under the abnormal conditions of captivity they have been laid singly, and in those few instances where they have been fastened to a green leaf it has always been underneath the tip.

Among the thirty-four moths examined there appears a considerable variation in the colour and width of the oblique stripe. All have been in immaculate condition.

22 appear to be typical specimens.

3 have the forewings a darker ground colour and suffused with pink and are probably ab. *sanguinaria*.

3 have ochreous forewings, the stripe being narrow and brownish and appear to be ab. *labda* (2 were females).

1 has a narrow stripe which is almost purple in hue.

5 have pale and less definite stripes than the others.

What a delight to see these little wandering ballet dancers of moths among the stocky and blundering noctuids!

Postscript: 10th September 1949.

Since drafting the foregoing notes, this moth has been found by myself and a friend in such numbers in the immediate neighbourhood of the field where the first record was made, that it might be said to be locally common as far as this district is concerned.

The ova obtained have hatched, with remarkably few failures after five days. All the larvae obtained are extremely active and growing rapidly on dock (*Rumex obtusifolius*).

A specimen of another immigrant of noteworthy occurrence has also been taken from the same area—the Small Mottled Willow (*Laphygma exigua*).

V. C. P. ALMY (1387).

COMMON OR RARE?

With reference to B. L. J. Byerley's (788) query in *Bulletin No. 105*, p. 68, I consider *Mutilla europeae* distinctly

rare, at least I have only twice seen it alive in over 50 years collecting. Once was on a waterlily leaf in mid-stream in the New Forest (where it appears to be most frequently taken) in June 1905; the other time at Benfleet, Essex, on a wall by the roadside (unfortunately another fellow saw it first) about 1938 but I have no note of the exact date. Both were females.

I cannot extend the range given by Saunders (*Hym. Acul.*, p. 46)—Essex, Kent, Surrey, Sussex, Berks, Hants, Dorset and Devon (S.).

K. G. BLAIR (197).

TWO QUERIES

On August 21st 1949, I spent a lazy afternoon sitting under an oak examining the snails which were massed amongst the foliage, refuse and grass at the oak's base. On nearly every one I found a very small insect running hither and thither over the snail itself. It was very small and of a greyish colour, and had the shape of a slim aphid. The snails, apparently didn't mind them and I could not find any traces of where these mysterious creatures had attacked the snails. Can anyone enlighten me as to what they were?

One of these snails had received a knock on its shell and where the shell was only partly repaired a very small brown beetle was feeding. It had eaten away a circular piece and was apparently boring its way in. As soon as I touched it, it quickly crawled away. Can anyone identify this beetle from the above?

ALAN P. MAJOR (1117).

(H. K. Airy Shaw (545) thinks the small creatures on the snails were probably mites. He has seen them himself, running over the surface of the mucus without difficulty.—Ed.)

A TOUGH CUSTOMER

About the 24th July 1949, I captured a Small Tortoiseshell (*Aglaia urticae*) and, not having a killing jar handy, I placed it in a relaxing tin. When I remembered it on August 6th, I opened the tin to find that the specimen though drowsy was still very much alive. Hitherto I have found that specimens left in the tin overnight were all well and truly dead the following day. If anyone can explain this interesting state of affairs I should be grateful.

J. B. OGDEN (1580).

A DAINY DISH?

While out with my lamp one night in August (1949) I noticed a Large White butterfly (*Pieris brassicae*) at rest. An earwig was busy nibbling the edges of the hindwings. The butterfly was not dead though very sleepy. Perhaps birds are not to blame for all the damaged specimens we find.

JOHN E. KNIGHT (94).

KILLING AGENTS

I have read with interest the articles from members putting forth their reasons for using a particular killing agent and their arguments for its supposed superiority over all others.

I have tried most of these at various times and my conclusions are that for all round general use sodium or potassium cyanide is the best.

Ethyl acetate will change the colour of *Geometra papilionaria* (the Large Emerald), *Euchloris smaragdaria* (the Essex Emerald) and *Hemistola immaculata* (the Small Emerald) from green to orange in a few minutes. I have had this happen frequently. I used pure E.A. in sealed bottles from a reputable firm, so there was no question of impure material being used.

I have used cyanide and never had any trouble like this, in fact I have in my collection some *G. papilionaria*, caught in 1928 and killed with potassium cyanide, which are still green. A well-made cyanide bottle will last for at least four years. I would advise the use of the sodium salt as this is not deliquescent, whereas the potassium cyanide is.

C. H. HARDS (176).

ILLUSTRATIONS FOR THE BULLETIN

Diagrams and drawings contributed by members to the *Bulletin* are often excellent as such, but having been drawn in pencil or writing ink are unsuitable for reproduction and have to be redrawn. The following notes may help those who, though quite capable of making good drawings, do not know exactly what is required for successful blockmaking.

Briefly, line-blocks, as used in the *Bulletin*, are made from drawings by a photographic process. The drawings must be dead black on pure white, or as near this ideal as possible. This is best achieved with Indian Ink on Bristol or Ivory Board. Smooth white paper can be used but board is less liable to be creased or damaged in its journeys between artist, editor, and

blockmaker. Toned or lined papers are unsuitable, and on a rough or woolly paper ink is liable to spread, giving lines a ragged edge. Lamp Black or Process Black can be used instead of Indian Ink, especially with a brush, but, for the amateur, ink is easier to handle. Ordinary writing inks do not photograph well and should not be used.

In the drawing only clean lines (no furry edges), dots or black areas should be made, with no greys or smudges. Greys and too thin or indistinct lines will disappear in the reproduction. For straight lines, especially in diagrams, a draughtsman's ruling-pen is invaluable, but an ordinary writing pen can be used quite successfully. For very fine work a mapping or "crowquill" pen can be used. A "crowquill" is best when it has been in use for a while and worn in. For the skilful, a fine pointed sable brush is ideal for curves, and for less formal work.

Where shading is necessary the individual lines should be kept clear and distinct. Cross-hatching is best avoided, but if used it should be kept very open. For drawings of insects, stippling (a pattern of small dots) is often helpful—there are some good examples of this in the *Silkmoth Reared's Handbook*.

Alterations can be made (on board) by careful scraping or paring with a razor blade, smoothing the surface with a knife handle or similar smooth instrument, and re-drawing. In the case of large areas to be altered a patch of paper can be stuck on and the section drawn in again. The patch will not show in the reproduction, though naturally the blockmaker prefers a clean drawing. Mistakes or blots can also be painted out with Process or Photo White (not Chinese White, which does not photograph pure white) but this is difficult to draw over.

Drawings can be made the size they are to appear, but it is more usual to make them rather larger, about twice the size, linear, than the reproduction required. Small blemishes and unevenness of line are then less noticeable or disappear. Illustrations for the *Bulletin* are preferred single column-width, where practicable. Column-width being two inches, the actual drawing should be four inches, the depth as required, in proportion.

If the drawing or diagram is fairly complicated it is best to work it out first in pencil and in the size in which it is to be reproduced. Then re-draw

it, enlarging to twice the size, and make sure that everything is correct before inking-in.

When your drawing is complete treat it with respect—give it a cover of thin paper, and a stout sheet of cardboard to protect it in the post. Don't send it rolled; rolled drawings are a nuisance to all concerned.

I hope all this will not seem too complicated to would-be illustrators; it is really quite simple, and only a matter of taking care. For any more detailed information there are a host of books on the subject, and the local library is sure to have a selection.

K. H. POOLE (133).

FIRST IMPRESSIONS OF LEPIDOPTERA COLLECTING IN SOUTH AFRICA

(Continued from p. 77)

Actual "bug-hunting" in this country is carried on by very few and those that pursue butterflies are still looked upon as being a little eccentric. There is no society which devotes its time to pure entomology. The "Entomological Society of South Africa" publishes papers, but these are for the most part concerned with pest control and economic entomology. Thus the average lepidopterist has a constant struggle to give himself the necessary inspiration.

The collecting itself is somewhat similar to England, in the Cape Peninsula that is—I know little about anywhere else, not having been further afield than about 50 miles from Cape Town. The area is very mountainous, and as many species have a habit of flying round tops of hills, one needs to be something of a mountaineer as well. During the summer months fine weather is dependable (a great blessing). The ground tends to be very dried up towards February and this is not a very good month. The best time for collecting is in the spring and early summer, but there are various species which only fly in certain months. As a rule there is no true hibernation, but during the winter most species are in one of the immature stages and there are few on the wing. *Vanessa cardui* L. is common all the year round, and can be seen on most fine days.

Another English species (if one can call it English) which occurs here is *Lampides boeticus* L., which is very common from November to April.

The *Satyridae* are represented by some twenty species. There is one Danaid—*D. chrysippus* L., which is common; of the *Nymphalidae*, there are only four species occurring within a radius of say 50 miles of Cape Town, and one of these—*Charaxes pelias* Cram.—flies only around the mountain tops. It is a very beautiful insect, black and orange stripes with four blue tails and a silverish underside. The largest family by far is the *Lycaenidae*, the actual "blues" numbering some eighteen species and the genus *Phasis* some twenty. There is one "Swallowtail," the ubiquitous *P. demoleus* L., which is known to the layman as the "Christmas Butterfly," and four Pierids, one of which, *Colias electra* L., is very similar indeed to the European *croceus*. These together with thirteen *Hesperiidae* make a total of approximately eighty species for the Cape Peninsula and area. This is but a poor selection of the four hundred odd butterflies known south of the Zambezi, but the knowledge of them, few though they be, is sadly lacking. Four varieties of three species are named, the pale form of *C. electra* simply being known as "Grey female form." The classification used in the S.A. Museum seems rather out of date, the Painted Lady being called *Pyrameis cardui* and the Long-tailed Blue *Lycaena boetica*, but as classification is a delicate subject, it is not for me to pass judgment.

Lastly, I would say that although much work has been done already, there is yet an even greater amount still to be done, especially with the moths, in order to bring the knowledge on a line with European or N. American fauna; but we must remember that S. Africa is a young country and time will show how soon this knowledge will be collected and published.

A. M. HOLMES (1198).

"THE BADGER"

E. G. Neal (467) is to be congratulated by all fellow members on having had so successful a book published by Collins as the first in the New Naturalist series of Monographs. For all AES members who are keen on life histories, whether of mammals or moths, this study provides a model of how to set about such an observational project. What-

ever subject for research is chosen, Mr Neal's painstaking care, accuracy of observation and store of patience to get the results in this book are an object-lesson to anyone who would emulate him. There is an inspiration in the book which makes one want to go and do likewise, difficult though the task may be.

T. T.

OBITUARY

It is with great regret that we notify the death of Mr Herbert Spencer (186) late of Elland, Yorks. The Society can ill afford to lose loyal members such as Mr Spencer. He had an amazing knowledge of northern species of insects, birds and all forms of nature, and was generous in passing on what he knew to any young naturalist he met. He retired last year and went to live at Royston, Hertfordshire. He continued in full enjoyment of his pursuits there in the early part of the season, but his health began to fail in July and he died in hospital at Cambridge on August 28th 1949. In his passing many have lost a good friend and the Society a grand worker.

REVIEWS

A List of the Lepidoptera of Dorset, Part II. By W. Parkinson Curtis, F.R.E.S. *Transactions of the Society for British Entomology*, Vol. 9, Pt. I. 11/- post free.

The "Introduction and Part I" of the List was published at the end of 1934. The List, based on Meyrick's classification, now takes us to the Family *Saturniidae*. Part II thus includes the Lymantriids (Family *Ocenebriidae*), the whole of the Geometers and Hawk moths and the Families *Polyphoridae* and *Saturniidae*. The gap between the issue of Part I and Part II, inevitably increased by the war, has caused the disadvantage that Part I is now scarce and Part II must have its Part I to be fully understood. Every possessor of Part I will get Part II, or, if he doesn't, he should put his Part I on the market, so that possessors of Part II can have a chance of completing their set.

Every amateur entomologist who aspires to produce a "Local List" of his own county or smaller area will have to have this Dorset list, if only as a standard to which to work. It is, of course, given to few people to work one area continuously for nearly sixty years; and though the author says in Part I that a "perfect list is beyond

human capacity" he very nearly proves himself wrong. This list when completed will be the main work of reference for Dorset for many years to come.

It is, of course, one of the objects of a local list to assess the frequency of occurrence of a species at a particular place and time for the benefit of future students. This assessment is most carefully and critically performed. For entomologists in other districts there is a particular interest in comparing the commonness or rarity of a species with one's own local experience. Every amateur entomologist cannot hope to produce a list like this of Mr Curtis, but by making a full and careful list of a restricted area, and labelling the specimens in his collection with full data, he can do work of real scientific value, which can be used in the compilation of a larger work, embracing a larger area. Such a modest ambition should not be difficult of attainment by the ordinary collector.

T. T.

Handbooks for the Identification of British Insects. Published by the Royal Entomological Society of London.

Vol. I, Part 5, *Dermoptera and Orthoptera*, by W. D. Hincks. (July 1949; 3/6).

This is part of the series of handbooks to be issued by the Royal Entomological Society of London. It consists of 20 pages; and has 74 line drawings illustrating the structure of those parts that are used in the keys for the identification of these insects. A general account of the life-history of each Order is given, followed by a key to the Families, Genera and Species. The keys enable one to identify not only our British species but also the common casual visitors to this country.

The Royal Entomological Society is to be congratulated on this attempt to satisfy a long felt want at such a low price. If all parts of this work are as simple and straightforward as this one we shall be able to name our captures with ease.

E. E. SYMS (406).

Vol. I, Part 10, *Odonata*, by Lt.-Col. F. C. Fraser (48 pp., 24 figs., July 1949; 7/6).

As long ago as 1900 McLachlan, when reviewing "British Dragonflies" by W. J. Lucas, remarked that there was still no scientific synopsis in English of our British species; and so it has remained almost till now. This Handbook at last attempts to fill

the gap, and provides a means of identifying our Dragonflies by the best characters. It includes an introductory portion on the general anatomy, brief paragraphs on biology, economics, collecting and preserving, keys to the suborders, families, genera and species of the adults, and a key to the nymphs. A notable feature is the large number of illustrations, the nominal 24 figures actually containing about 200 separate figures of the structural characters of the species (very necessary for secure identification) and of some colour-patterns.

The Handbook should enable anyone to determine the British species correctly, though it is necessary to give warning that there are some pitfalls for the unwary: in the key to the families of *Zygoptera* no mention is made of the important and obvious differences in the origins of veins IR_3 and R_{4+5} and the presence or absence of intercalated veins between the main named veins (see the figures); the key to the genera of *Coenagrutidae* will give trouble at Nos. 1 and 4 (many specimens of *Erythromma*, *Enallagma*, and *Pyrrosoma* will run out to the wrong section of the key) and at No. 5 (only males of *Ischnura* have the bicolorous pterostigma), so that specimens will have to be carefully checked against the specific characters to be sure of the genus; the var. *rubellum* of *Ischnura elegans* is usually and correctly known as var. *rufescens*; in the key to species of *Aeshna*, the character of the colour of venation and pterostigma as given will be found to be misleading; *Aeshna isocetes*, not *isosceles*, is now known to be the correct spelling of the name, and it alone of the British species of the genus has the superior anal appendages of the male with a basoventral tubercle (it needs a big stretch of the imagination to call it a spine!); in the key to the genera of *Corduliidae* it will be quite impossible to distinguish some specimens of *Cordulia* and *Somatochlora* by the characters given, and they will have to be checked by the specific characters; in the key to genera of *Libellulidae*, Nos. 1 and 2, the character of the most distal antenodal being incomplete or complete applies to the forewing only, and moreover many specimens of *Libellula* vary in this character. The key to the nymphs must be used with great caution, particularly in the *Zygoptera*, as some of the characters used are not sufficiently certain, for there is still much work to be done in searching for reliable differentials.

In reviewing a work of this kind, it is an ungrateful but necessary task to call attention to misleading key-characters; but it is a work that should be possessed by all with any interest in the *Odonata*, however slight, and it should help, too, to awaken interest in those who at present have none; the clear illustrations of the important structural characters of the species are not available in any other British book and will always be of great value. J. COWLEY (771).

Vol. IX, Part I. *Diptera*. I. *Introduction and Key to Families*, by H. Oldroyd. (49 pp. 1 Colour Plate, 97 figures, 7/6).

This is one of the first three books to appear in this series. Its appearance is greatly welcomed, for many of us have urged the provision of cheap, concise and accurate keys to the British insect fauna. Perhaps to the young amateur entomologist, often of slender means, the price may at first seem rather high, but after a perusal of this portion of the projected series, and knowing the present high cost of production, the expense will be considered justified.

The key, of just over 6 pages, will enable the beginner to run his captures of flies down to the family concerned. This part of the work is a great advance over the only two previous keys dealing with our country's flies and, judging by many tests made, is really workable.

The introduction forms the bulk of the book, which is amply and extremely well illustrated, explaining each term used in the key and at the same time briefly reviewing the structure, etc., of flies. The headings include Structure, Biology and Early Stages, Collecting and Preserving *Diptera*, Classification and a List of the 76 Families.

The careful way in which each technical term is explained and the quotation of alternative names as used by various authors will be greatly appreciated by all readers. This clarity will ensure a complete understanding of the key and sets an admirable example to the authors of future parts which are now, more than ever, eagerly awaited.

Occasionally figures are not printed opposite or alongside the relative text: a minor point which could be adjusted in the next edition.

A useful bibliography of over 50 items and an adequate index complete the contents.

L. PARMENTER (895).

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Applications for new membership to: S. M. HANSON, 167 Gunnersbury Park, London W.5. Also offers of help with AES work, and suggestions for improvements in our organization.

Silkmoth Reared's Handbook. Data for the revised issue to: W. J. B. CROUCH, 5b Stanley Crescent, London W.11.

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VOL. 8

No. 108

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CEMBER - - 1949



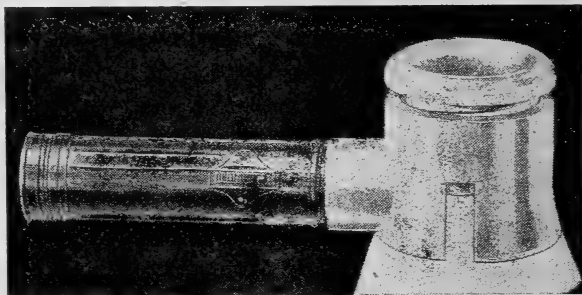
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No. 108

BULLETIN

DECEMBER 1949

EDITORIAL

We welcome in this number an account of the *Psocoptera* from Dr Edward Broadhead, of the University of Leeds. We hope that some of our members may take up the study of these little-known insects, and that many members will respond to Dr Broadhead's request for specimens. It is very little trouble to send on a specimen and the sum of the information obtained will be of considerable scientific value.

Many members have written in, giving more information about mites on different insect hosts. The Editor hopes that these will be published, as a symposium, in an early *Bulletin*.

The attention of members is drawn to the fact that Mr G. B. Hodges, our Assistant Treasurer, has been compelled to relinquish his duties on account of other commitments. We are grateful to him for the very valuable work he has done and regret that he finds himself unable to carry on with it. Members should now send their subscriptions direct to the Treasurer, Mr P. C. Le Masurier, 85 Warren Drive, Tolworth, Surrey. These, of course, are due on the 1st January 1950.

ESSAY COMPETITION FOR JUNIORS, 1949

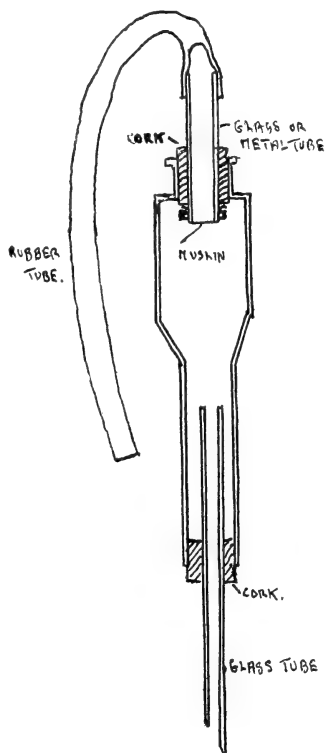
Junior Members are reminded that, as announced on p. 42 of the June *Bulletin*, the closing date for this year's Essay Competition is 31st December 1949. The subject is "The Group of Insects I like Best, and Why." The essay should be between 600 and 800 words in length and must be sent to the Youth Secretary, 31 Pinner View, Harrow, Middx., before 31st December 1949.

A HOME-MADE POOTER

Before I joined the AES, I did not know that pooters existed, but a description of one in the *Hymenopterist's Handbook* interested me and I decided to make one. Now I don't know what I did without it. The

basis of my pooter is a battery hydro-meter, bought at a Government surplus store. The suction bulb and float were removed and two inches were cut off the end. Pieces of tubing were fitted into corks at both ends; the larger bore having a piece of muslin held over the end by a small piece of rubber tube. The end of the narrower tube was ground at an angle; I find this greatly facilitates sucking insects from the side of the net.

F. E. KENINGTON (1549).



INSECTS IN S.E. DEVON IN 1949

There were one or two notable occurrences in S.E. Devon this last summer. First, *Colias croceus* (the Clouded Yellow) has been a common butterfly all the spring and summer

from April onwards and at the time of writing (October 4th) there appears to be a fresh emergence with a fair sprinkling of var. *helice*. Certain of the Vanessids have been extremely plentiful, notably *V. atalanta*, which has been flying in dozens round fallen apples, together with a great many hornets, to say nothing of clouds of wasps. The one Vanessid which has been extremely scarce is *N. io*. I saw a few odd ones after hibernation in the spring, but I doubt if I have seen half a dozen in the autumn. *L. phlaeas* is at the moment very abundant and "Whites" have been well up to the average.

Early in September a friend telephoned me from Thurlestone that three *Celerio livornica* had been caught by a neighbour in his garden. This put me on the *qui vive* and at about 7.50 p.m. (B.S.T.) on September 16th I observed a strange moth hovering over petunia flowers in company with numerous Silver Y's. I dashed for my net and made a complete capture of moth and petunia. It turned out to be a very nice specimen of *livornica*. Unfortunately, it was a lone wolf and I have seen none since.

Axminster,
S.E. Devon.

A. BLISS (287).

CORRESPONDENCE

Dear Mr Editor,

On reading Mr Ogden's letter in *Bulletin 106*, p. 76, I am tempted to be amused at his remark concerning the artistic tendencies of some of our members. Why, for instance, is "fancy" mounting "useless" and "appalling"? Most amateur entomologists are not "scientists" and indulge in the hobby as a pastime; but they still may have tidy minds regarding the appearance of their insects and are unhappy over badly-set and untidily-mounted specimens. In fact, nicely mounted specimens are better from both the scientific and the hobby angles, when examination is necessary.

Regarding labelling, I agree that a notebook or catalogue is a great asset to any collection, but I hope our young members will not be misled into omitting data labels. These are most essential to any collection and are usually omitted from a selfish point of view, i.e., to prevent others learning a "locality."

When a collection is broken up, what use are notebooks and insects

sans labels? They are valueless from any angle, especially the scientific one.

Yours, etc.,

H. E. HAMMOND (423).

1/10/49.

COLLECTING PSOCOPTERA

By Dr EDWARD BROADHEAD, M.A.,
D.Phil., Zoology Department, The
University of Leeds.

Beating a single branch of oak or spruce in the later summer months will often bring down on to the tray a host of small winged insects, superficially similar to psyllids. They may be recognised in the field as psocids or *Corrodentia* by their long antennae held sometimes in front of the head or sometimes directed backwards along the side of the animal, and also by the roof-like posture of the wings (fig. 1). Some are extremely minute—

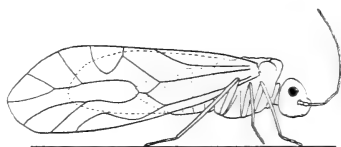


Fig. 1.

little more than $\frac{1}{2}$ mm. long—but after a little experience they are easily recognisable in the field by their characteristic posture. Existing in such large numbers, they must play an important part in the food chain in the woodland or hedgerow, but hardly any information is available on their enemies, whether predators or parasites. On several occasions spiders have been captured with their psocid prey, but they must also be eaten in large numbers by very many small carnivorous insects such as neuropterous larvae, some beetle larvae, etc. The group *Corrodentia* or *Psocoptera* is a relatively small and compact Order—with some 1500 described species, of which only about 70-80 are found in Britain. Perhaps their neglect by British amateur entomologists is due to their small size and delicate nature, entailing the storage of a collection in alcohol, and the necessity of preparing permanent microscope slides for their detailed study. In the last century McLachlan made many contributions to our knowledge of the British psocid fauna—his monograph is to be found in the *Entomologist's Monthly Magazine* for 1867—and Mr J. V. Pearman of Bristol has contributed

a long series of papers in the last 25 years. Dr A. Badonnel of Paris has recently produced an extensive monograph on the European psocids in the *Faune de France* series, 1943. The handbook for the identification of the British psocids, at present in preparation by Mr Pearman for the Royal Entomological Society, will enable any young amateur entomologist interested in the group to become acquainted with the British fauna with the minimum delay and energy. So few life-history studies have been made that the enthusiastic amateur can contribute results of scientific value in this field without the exhausting enquiry into the literature which is inevitable in the case of larger groups of insects. Locality lists of species are still few and far between, particularly in northern England and in Scotland, so that the northerly range of the vast majority of British species has still to be investigated. I recently collected specimens of the apterous *Bertkavia lucifuga* in Aberdeen, some 300 miles north of any of the previous locality records in this country.

Perhaps it would be appropriate at this point to indicate some of the methods I have found useful for practical study of the group. Psocids are such fragile creatures that dry mounting renders the specimen of little future use except for wing characters. Spirit preservation is normally essential. I have found the method of storing described by van Emden (1942, *Ent. Mon. Mag.*, 78: 73, Pt. III) very convenient. A reference number in indian ink on a paper circle is placed at the bottom of a small glass tube and held by a plug of cotton wool, the insects in alcohol being then introduced and the mouth of the tube sealed with another plug of cotton wool. These tubes are then inverted in a wide-mouthed jar containing spirit. Examination of genitalia, claws and mouth parts is often required for an adequate identification. These may be shown to perfection by treatment with cold 10% KOH, followed by staining in 1% acid fuchsin in 50% alcohol, acidified with glacial acetic acid. After dehydration the specimen may be dissected and a permanent mount in euparal or canada balsam made. By this means any sculpturing of the cuticle and the bristles are clearly visible and prolonged examination of such slides is

very much less straining than of unstained mounts in a chloral hydrate mountant. Small dissecting needles with which the removal of genitalia from the smallest psocid is rendered simple can be made by pushing the end of a small headless stainless steel entomological pin (used for the mounting of Microlepidoptera) into match sticks. By similarly mounting an ordinary beheaded entomological pin, with its point hammered flat, a small spatula can be made, allowing quick transference of specimens from one fluid to another.

A few words on the state of our knowledge of the British psocids may be helpful to anyone contemplating the study of the group. First, the taxonomy. At the species level most of the British representatives have been described adequately enough to permit an identification of adults, but nymphs at present are unidentifiable. As regards the higher groupings and particularly the major subdivisions of the Order, further knowledge, particularly of some of the tropical forms, is necessary before any general agreement is reached. Schemes of classification have been put forward by Kolbe (1880), Enderlein (1911), Tilliard (1926), Banks (1928) and Karny (1930), but that put forward by Pearman (1936) is the one tentatively accepted at present by most authorities on the group. It need hardly be added that the fossil Psocoptera, although relatively few and imperfect, must be a major consideration in deciding any primary dichotomy of the Order. At the sub-species level, our knowledge is very meagre. Here, of course, detailed descriptions with adequate biometric data of samples of populations from different localities are required and in many cases further knowledge of geographical distribution and means of dispersal are desirable. In the genus *Liposcelis*, forms of subspecific rank have been recognised, but the widespread dispersal of these species by man has made their study more complicated than is likely to be the case in the majority of the winged species. Studies of such closely-related forms or of closely-related species require, of course, ecological as well as taxonomic data. In this connection, there is scope for a detailed study of the two species *Elipsocus hyalinus* and *E. westwoodi*. Little is known of the behaviour, geographic range, and habitat requirements of these two

species, nor is it known whether hybridisation is possible either in controlled breeding under laboratory conditions or in nature.

(to be continued)

LEPIDOPTEROUS AIR-PATHS— A THEORY

Entomologists and field collectors generally have been in the habit of noting phenomena, some of which at the time of observance have had no obvious explanation for their occurrence; and those of our fraternity who have weighed the facts and have been in an inventive frame of mind have propounded theories to fit these facts. Subsequently some have been proved correct on further investigation.

I was discussing with a fellow-member a short while ago the possibility that Lepidoptera may tend to use air-paths or flight-tracks and was persuaded finally to put pen to paper as I feel that useful observations and discussions may be forthcoming on this subject.

For some years I noticed that certain rooms in the house at Sevenoaks where I lived seemed far more attractive to moths than others, while certain street lamps were constantly far more popular than those adjacent to them, though both the popular and the unpopular were of the same type and were in similar situations with regard to the local countryside. With sugar I found the same sort of thing happening. A row of trees would be sugared, where one tree differed in no way from the rest in type, size, position of sugar-patch and general location, yet some of these were constantly far more productive than the others.

The question "Why?" arises immediately and I think this may be answered in either of two ways: either the insects may detect a difference, imperceptible to us, and are attracted to the more popular lure, or they may use flight-ways or air-paths which occasionally coincide with our artificial lures.

Of the two, sugar and light, the latter will, I think, prove the most useful medium for experimental purposes as this seems to be the more constant attraction and the more easily controlled.

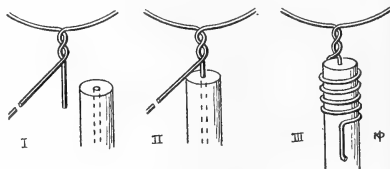
To prove or disprove the above theory will involve a considerable amount of time and trouble, and

there will be many difficulties to overcome, and factors to be taken into consideration (deflections, counter-attractions, etc.), before any definite answer can be given to this interesting question.

T. G. HOWARTH (1627).

A NET FITTING

I was more or less forced into devising this method of attaching the ring of a net to the handle as I was unable to obtain, at that time, a ferrule which was suitable.



[Figures. Fig. III is completed article.]

The wire most easily manipulated is $\frac{3}{16}$ " iron wire, and this has all the necessary strength. The method has the advantage that the ring can be removed from the handle, and thus is more suitable for transport than are many types.

The figures above should enable anyone to make one to this pattern. A better fitting is obtained if the "false-ferrule" is wound round a slightly smaller handle than will be actually used.

PETER A. GAY (1393*).

NOTES ON A MITE FOUND IN THE NEST OF THE COMMON CARDER BEE

Whilst investigating the inquilines and parasites in a nest of the Common Carder-bee, *Bombus agrorum*, I came across a mite in cells of that species of humble-bee.

Step suggests that mites are not parasitic on humble-bees, so the following observations may be of interest.

The mites were present only in those cells containing instars previous to the pupal instars. In the majority of cases they were found in the cell containing eggs. On an average there were twelve eggs in a cell, and about the same number of mites. Two or three were each attached to an egg, the rest clinging to the walls.

In two cells eggs were found which appeared to have been deflated and

in those particular cells the largest mites were found.

Mites in ones and twos were found in cells containing larvae at all stages of development, but no mites were observed clinging to the larvae. In those cells containing pupae, no mites were found.

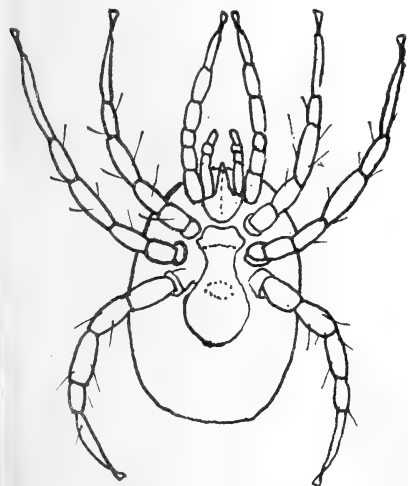
External to the cells the mites were found in two places:—(a) On the outside wall of the cell, and of those examined all were large and fully developed; (b) in the layers between cells and of these examined all were small, white and in the nymphal stage.

I would suggest that the mite is parasitic on the eggs only, and feeds by sucking out the contents; but only further observation will reveal its life cycle and its relation in the nest, with the inhabitants.

The mite is a dull brown colour and the accompanying drawing gives an idea of its form.

I should be glad to hear from anyone who has any information on the subject of mites in bees' nests.

HENRY R. WALLACE (318).



VENTRAL
Magnified $\times 75$

DEGREASING

Replying to W. J. Mead (1578) under the above heading in *Bulletin* No. 106, p. 73, I would like to suggest that he tries carbon tetrachloride for degreasing. I use it myself and find it in every way a satisfactory degreasing agent. Immerse the insect in it for the usual period (from 2 to 48

hours, according to the size of the insect and the amount of grease content), take it out and dry. Brush up the hair with a fine camel-hair brush and they will look as good as new.

C. E. SPITTLES (1483).

ENTERPRISING LARVAE OF THE ANGLE SHADES

In the course of breeding experiments with *Phlogophora meticulosa*, the (Large) Angle Shades moth, I have noticed how the larvae sometimes chew their way through the gauze or muslin covers of the breeding receptacles. This not infrequently happens when the larvae, which are voracious as well as practically omnivorous, are deliberately kept on short commons: in one case nearly a whole jar cover was eaten away. Also, like certain other species, they sometimes "raid" the fabric and incorporate portions of it in their light webs or cocoons prior to pupating, especially if the normal pupating medium is in short supply and the more so when the caterpillars are overcrowded. Similarly, if paper is introduced they will chew it and utilise well-shredded pieces for the same purpose.

But these examples by no means illustrate the full scope of their depredations or the more surprising of their enterprising habits; for a fellow-entomologist tells me that, during the war, he made sandbags from sand dug in his garden and one of these larvae "ate through the sack and spun up on the outside of it."

The same correspondent (who is also a doctor) writes of an even more intriguing incident, which I record without elaborating. A friend of his bought a packet of a certain well-known brand of cigarettes, and, on opening it, found therein a caterpillar about an inch long. He left it in the packet with a few cigarettes, with the intention of giving it to my correspondent, but forgot all about it. Subsequently he remembered, and handed the packet over. It was then found to contain "a fair specimen" of *P. meticulosa* in the adult state, together with the empty pupa-case, "still in a cocoon made of the tobacco and two rather mangled and eaten cigarettes." Comments the surprised recipient: "I am wondering if all this is a reflection on the amount of tobacco in this brand of cigarettes, because after all nicotine is one of the most potent

human toxins and I should like to ask a toxicologist the chance of its being harmless to such a lowly creature as *P. meticulosa*."



By way of addendum it may be mentioned that the Angle Shades is a pest on chrysanthemum and other plants in greenhouses; and that whereas lead arsenate, cryolite, and derris powder have proved useful in controlling the larvae, it has been found (to quote Parr and Speyer) that "a brand of pyrethrum dust which had proved of great value in control of aphides and thrips proved useless in preventing (*meticulosa*) caterpillars from feeding, and also had no contact action upon them; there can be little doubt that they actually consumed the powder without any ill effect to themselves." This latter information is furnished in a paper on the life-history of the species published in the *Annals of Applied Biology*, Vol. 28, pp. 29/33 (February, 1941).

PETER MICHAEL (748).

DEGREASING—A WARNING

Trichlorethylene is undoubtedly an excellent grease solvent. I, too, have found it superior to petrol, benzine, or "Thawpit." Although all these are effective, trichlorethylene is swiftest in action; but it must be remembered that the action is mostly from the outer surface of the abdomen inwards, and therefore time to complete the solution of the grease is essential. I find that, even with small moths, at least a week's soaking is desirable, and I allow ten days for large ones, or those that experience shows to be the worst. A few hours

are *never* sufficient; the grease from inside will reappear in a few months.

G. W. HARPER (1169).

NOTES ON BREEDING THE DEATH'S-HEAD MOTH IN CAPTIVITY

Although most books state that *A. atropos* is a scarce insect, I think it is more a case of it being overlooked as the foodplant is mainly potato and potato fields are usually private property and off the beaten track.

In my opinion the best way to obtain perfect specimens is to insert a judiciously worded paragraph in the local newspaper to arouse interest, preferably offering a monetary reward. This usually brings a flood of all types of insects in all stages, and if one is fortunate the larvae or pupae of *atropos*. Unfortunately, the latter are very delicate and if roughly handled will either produce cripples or mortify. If larvae are acquired these must be provided with 12" of warm damp peat for pupation, and should not be disturbed until one month after they go down. Attempts are sometimes made to keep the pupae through the winter without forcing, but these are usually unsuccessful.

An ordinary biscuit tin makes a simple incubator. Fill with peat to a depth of 4" to 5" and place several pieces of perforated zinc round the edges to give foothold for the freshly-emerged insect to dry its wings. Heating may be by several methods, but before placing the pupae in the tin, the peat should be soaked with hot water and the lid closed. This raises the initial temperature from 75° to 80° but the pupae should not be put in before the surface has cooled enough for the finger to bear. A tin will hold about 12 pupae laid on the peat without touching. The receptacle may now be placed in an airing cupboard or on a shelf over an oven, etc., but avoid gas fumes if possible. An electric light bulb hung inside the tin is admirable. For those without such means at their disposal a Tilley or other pressure lamp placed as close to the tin as possible is satisfactory. I have always used this method with success. Whatever method is used, it is absolutely essential that the temperature must not be allowed to drop, for if the pupae become chilled even for a few minutes they will die. Humidity is also essen-

tial. I pour hot water on the peat (not the pupae!) every 4 hours.

The moths are erratic in their emergence due to the state of development of the pupae when acquired. From 14 to 32 days has been my experience. I have watched many of them emerge and several times released one which was unable to liberate itself. This is a practice not to be recommended and only to be used with discretion. When the case splits and the legs appear the moth should be free within 30 seconds. After emergence it is advisable to let the insect fly round the room for a few moments to ensure the full development of the wings. The best killing agent is cyanide. I made a special bottle in 1945 from a 7 lb. sweet jar, using 4 ozs. of cyanide. This has been in constant use ever since and is invaluable for all large insects. Never use chloroform. On the only occasion I did, I was unable to relax or set the moth afterwards.

ROBERT W. WATSON (752).

"SPRINGING"—CAN IT BE PREVENTED?

E. WEIGHTMAN (1485) writes:—"Could any member give me any hint on how to prevent specimens, after being removed from the setting boards, from curling and springing? I have had many specimens affected thus and find it difficult to remedy. I leave my specimens on the boards at least a month." He writes further that this springing does not occur till two or three months after taking the specimens off the boards. He has been collecting for nine years and this is the first time he has had any trouble at all. His cabinet is away from damp.

Commander G. W. HARPER (1169) has the same trouble and also asks:—"Does anyone know a satisfactory cure for the distressing tendency of small moths, in particular certain Geometers, to 'spring' or 'droop' after setting? I have tried the classic method of applying formalin vapour during setting, but I am not convinced of its efficacy; moreover, I have proved by bitter experience that green colours fade worse under its influence." Commander Harper also asks whether anyone knows the secret of preventing fading of green species, particularly the Emeralds.

Note:—W. F. Kirby, in *The Butterflies and Moths of Europe*, p.

lxiii, after emphasising the necessity for the insects being left on the setting board till "thoroughly dry," says:—"For greater security, some collectors touch the roots of the wings beneath with liquid glue when they remove them from the setting boards." J. W. Tutt, in *Practical Hints for the Field Lepidopterist*, p. (20), in describing the operation of setting, calls attention to the fact that the bases of the wings beneath should be raised very slightly above the level of the board. "This prevents 'springing' which usually occurs when the bases of the wings are slightly below the level of the setting-board at the point where the thorax rests."

Can any member supplement this information from his own experience? The Editor, when his moths have sprung, has been inclined to blame himself either for inexact centring of the pin in the thorax, which might set up asymmetrical strains in the musculature of the wings during drying, or for inadequate relaxing of the specimens. Small moths dry so quickly that, particularly in extra dry weather, the time taken in the mere manipulation of pinning and setting may be long enough for them to become a little too rigid, unless they have been put into a relaxing tin for a spell after killing.

MARKING MIGRANT INSECTS FOR RECOVERY

J. L. Campbell, M.A., at the Isle of Canna, in the Inner Hebrides, since August 28 (1949) has been releasing butterflies marked with spots of Cambridge blue paint on various parts of the wings, and is to be congratulated on at least half-a-dozen Painted Ladies (*V. cardui*) having since been reported up to 130 miles in a S.E. direction, one taking a week to Grangemouth in the Firth of Forth.

In June (1949) some 200 Painted Ladies were marked in Switzerland, when more than a million were migrating N.E. to Lake Constance. The Swiss organisation also uses paint spots on the hindwings, the colour denoting the observer's marking place. On the Continent it is the custom of bee-keepers to mark their queens with gold or silver spots on the thorax. This is known as the Eckhardt type of marking and an outfit for the purpose is now standardized and sold by Messrs Robert Lee (Bee

Supplies) Ltd., of Beehive Works, Uxbridge, Middlesex. The outfit costs 5/6, and is called "No. 352 Queen Marking Outfit with numbered discs." The discs are on red, green, gold and silver paper with a spring plunger for applying and a small bottle of liquid glue is supplied as the adhesive. The system might be adopted for trial with Lepidoptera along our south coasts in the spring and in the north in autumn for return flight. If the Editor is informed of localities where marking is done the choice of four colours and numbered little discs should rarely lead to doubt as to origin when recovered, but it is hoped that only migrating insects will be marked and not bred specimens or those long kept in captivity. V. Almy (1387) has marked and released some of the thirty-four captured at Plymstock before September 10 (see *Bull.* 107 p. 83). These were all Vestals (*R. sacra*) but the marks used were not reported.

Some years ago T. Bainbrigge Fletcher (52) at Stroud (Glos.) marked many resident species and obtained recoveries up to ten days showing the rate of dispersal at random was higher than expected. The butterflies were marked with numbered tabs of tracing paper stuck on apical points with Canada balsam. Someone else tried dipping *P. brassicae* wings in red ink!

T. DANNREUTHER (60).

(Dr E. L. Ford in *Butterflies*, p. 271, gives a system of wing-marking used in population studies. It might be useful for some authoritative body to experiment and lay down a standard system of marking for general use.—Ed.)

A NIGHT'S SUGARING ON THE SANDHILLS

My father and I went out to sugar a row of posts on some Sussex sandhills about sunset on the 17th August (1949). It was a lovely calm, warm evening with practically no wind.

As we walked across the parched grass, there were many Crambids flying, and swarms of gnats rising out of the ditches. Here also we saw many Wainscots dashing about; these turned out to be *Leucania pallens*, promising better things to come.

Soon we reached the sandhills, which were covered thickly with tall Marram grass, with an inviting row of wooden posts along the top.

My father then opened his tin of "sugar" adding some powerful peardrops-smelling amyl acetate. Soon he had painted fifty or more posts, lighted the paraffin lamp; and we were ready for the fray.

Never have I seen so many moths! On most of the posts there were over twenty, fighting to get at the sugar. There were never less than six.

Far and away the commonest species was *Agrotis segetum*, with wonderful variation, jet black and pale grey and shades of brown and red. Other common species were *A. ypsilon*, *A. saucia*, *A. puta*, *Amathes c-nigrum*, *A. xanthographa*, *Ochropleura plecta*, *Triphaena pronuba*, and single specimens of *Lampra fimbriata*, *Hadena trifolii*, *Amphipyra tragopogonis*, *Procus furuncula*. There were also some fresh *Agrotis vestigialis* and two *Caradrina ambigua*.

Among the host of moths on the sugar was a bright red moth with a white speck in the middle of the forewing, which turned out to be *Leucania albigutta*, the prize of the evening.

MICHAEL W. HARPER (1553*).

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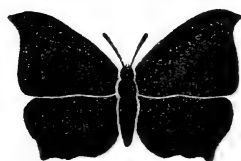
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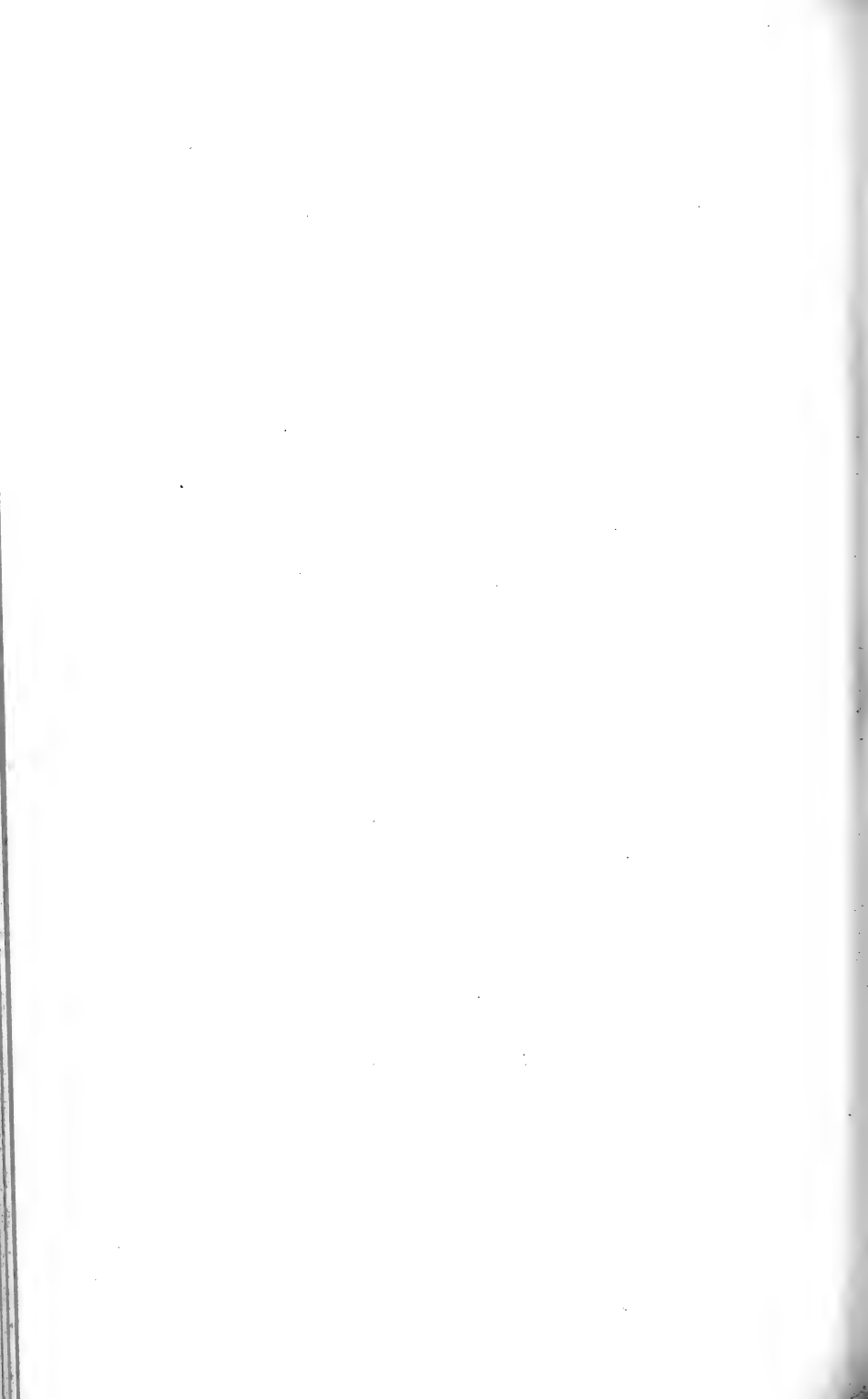


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Edited by
TREVOR TROUGHT, M.A., F.R.E.S.



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INDEX

Compiled by **S. M. HANSON, F.R.E.S.**

CONTRIBUTORS

Alderton, R. F., 70
 Almy, V. C. P., 59
 Balfour-Browne, F., 61
 Beaufoy, L. S., 16
 Benson, R. H., 18, 45
 Binning, H. G., 87
 Bird, P. F., 19
 Blair, K. G., 45
 Blathwayt, C. S. H., 107
 Bradley, A., 23
 Brangham, A. N., 52
 Briggs, J., 32
 Broadhead, Dr. E., 4
 Bromley, P. S., 58
 Brown, S. C. S., 89
 Bull, G. V., 17
 Burrows, D. N., 44
 Capener, A. L., 11, 47
 Carpenter, Prof. G. D. Hale, 2
 Cave, R. G., 104
 Cockayne, Dr. E. A., 3, 12
 Classey, E. W., 68, 82, 83, 108
 Collinson, W. E., 30, 100, 106
 Crotch, W. J. B., 69, 78, 91
 Currie, P. W. E., 1, 12
 Dale, G. V., 6
 Day, G. V., 19
 Duke, A. J. H., 15
 Evans, J. J. T., 8
 Fidler, J. H., 10
 Gardiner, B. O. C., 8, 48, 68, 89
 Gay, P. A., 17
 Gent, P. J., 15, 88
 George, R. S., 31, 32
 Green, J., 58, 74, 108
 Hammond, H. E., 8, 26, 57, 66, 75
 Hanson, S. M., 50
 Hall, J. H. V., 66
 Harper, G. W., 15
 Harrison, E., 62
 Haxby, C. R., 22
 Henstock, Dr. H., 42
 Heppell, D. H., 67, 70
 Holloway, P. H., 28, 31, 74, 87
 Holroyd, G. C., 25, 29
 Hopkins, Miss B., 19, 40
 Horner, L. B., 96
 Howitt, R. C. L., 21
 Hutchings, G. E., 4
 Hutchison, D., 95
 Hyatt, K. H., 67
 Ika, Miss N. O., 16
 Jarvis, C. M., 9
 Jesper, D. M., 18, 26
 Johnson, J. H., *
 Knight, J. E., 24, 43
 Leeds, H. A., 54
 Le Masurier, P. C., 40

Lewis, E., 48
 Lyon, F. H., 86
 Maclaurin, A. M., 107
 Manly, G. B., 104
 Major, A. P., 43, 58, 72
 McCormick, W. J., 102
 Mead, W. J., 59
 Michael, P., 44, 62, 81, 84, 103
 Moore, J., 62, 63, 86, 89
 Morgan, H. G., 21, 39
 Moss, B. T., 6
 Nash, O., 75
 Newman, D. E., 55
 Newton, A. H., 36
 Parsons, R. E., 54, 70, 96
 Parsons, T., 58, 81
 Payne, J. H., 52, 53
 Pearson, A. E. G., 94
 Platts, J. H., 54
 Poole, T. B., 70
 Putnam, C. D., 86
 Ranger, J. A., 63
 Ray, H., 7
 Renfrew, C., 30
 Roberts, W. N. T., 38
 Russell, S. G. Castle, 22, 34
 Russell, W. E., 40
 Sargent, H. B., 22, 67, 102
 Shaw, H. K. Airy, 20, 21, 84
 Sheppard, P. M., 42
 Showler, A. J., 52
 Shield, D. N., 92
 Smith, K. G. V., 99
 Stallwood, B. R., 43, 59
 Symes, E. E., 100
 Taylor, P. G., 63, 72-76, 81
 Taylor, M. F., 87
 Todd, A., 74
 Townsend, A. L. H., 72, 94, 106
 Tremewan, W. G., 6, 90
 Trought, T., 40, 84
 Uffen, R. W. J., 87
 Wade, D., 91
 Walsh, G. B., 9
 Walter, P. W. R., 96
 Ward, K., 55
 Watson, R. W., 19
 Watts, W. J., 74
 Webb, H. E., 24
 Whicher, L. S., 31
 White, O. M., 6, 19, 25
 Wright, A. H., 96

SUBJECTS

Abstracts:—88

Notes on a brood of *Nymphalis poly-*
chloros, 15

Photoperiodism and diapause in in-
 sects, 47

- AES Field Meeting, 87
 Amateur Experts, 93
 Ancestral Insects, 69
 Angleshades, Miscellaneous notes on, 79
 Angleshades, in December, 81
 Annual Exhibition 1950, 49, 88
 Annual General Meeting, 48
 Assembling Emperors in Hampshire, 44
 Beekeeping, 17, 25
 Beekeeping in the Mountains, 42
 Beetle Extractor, A, 46, 74
 Beetle Larvae, A case of Cannibalism in, 74
 Breeding Notes:—
 Breeding sites of Butterflies, The, 6, 24
 Clouded Yellow, 16
 Large Tortoiseshell, 15
 Pale Tussock, 19
 Purple Emperor, 24
 Second Year Privet Moths, 16
 The Gem, 90
 Time of Emergence from Pupae, 15
 Vestal Moth in 1949, 23, 42
 Cannibals, 'Ware, 56
 Chimney Sweeper, The, 64
 Collecting Notes:—32
 In Kenya, 71
 In the Army, 53
 In the Highlands, 85, 104
 Psocoptera, 4
 Sphingidae in South Africa, 13
 Spiders' Webs, 17
 Street Lamps, at, 43
 Collector in Industrial Areas, The, 99, 106
 Common Marbled Carpet, 62
 Common Wing Patterns in otherwise Divergent Tropical Butterflies and Moths, 94
 Correspondence, 21, 51, 68, 94
 Clouded Yellow, The, 52
 Dark Green Fritillary, Localisation to very small areas, 70
 Deaths-Head Moth, The, 22
 Distribution of Orthoptera, 62
 Double Mating of Eyed Hawk Moth, 86
 Editorial, 1, 9, 21, 29, 41, 77, 101
 Eggs of Dark Spinnach Moth, 19
 Emergence of a Butterfly, The, 7
 Feeding Behaviour of *Lestes sponea*, 108
 Festival of Britain, 70, 100
 Field Collecting Tip, 22, 52
 Film Show, 49
 Finding and Breeding the Purple Emperor, 24
 Flies at Sallow Bloom, 25
 Frontina laeta, 75
 Hampshire Countryside, 26, 73
 Heath Fritillary, The, 39, 52
 Hints (see "Technique")
 "Hopper," An interesting, 102
 House Cricket, Abnormality in the, 39
 Immigrant Records, 6, 39
 Insect Orders, 89
 Insects and Motor Cars, 74
 Inter-Species Pairing in Lepidoptera, 19
 Itinerant Apiarists of Australia, 84
 Job to do now, A, 26
 Juniper Hall Field Centre, 4
 Labelling, 48
 Labelling of Specimens, The, 2, 3, 31, 63
 Larval Colours, 72
 Larval Colours of the Pale Tussock, 19
 Lepidoptera near Hull in 1949, 91
 Lepidoptera, North Devon, 102
 Lepidoptera, Yorkshire, 96
 Lepidopterist's Lament, A, 52
 Lepidopterous Air-Paths, 76
 Mantis, Pet, 91
 Migrant Records, 63
 Mites:—
 On Bees, 75
 On Insects, 57
 Moment's Reflection, A, 87
 Mosquito control, 107
 Mosquitoes, A suggestion, 81
 Moths visit Town, 32
 News Item, 74
 Nomenclature, 45, 61
 North Devon Lepidoptera, 102
 Notes and Observations, 18, 19, 55, 67, 70
 Notes on Collecting in the Highlands, 85
 Obituaries:—
 C. K. Smith, 18
 W. E. Dale, 55
 W. T. Mellows, 83
 Other Records, 96
 Phosphorescent Millipedes, 92
 Population Notes, 16, 43, 66
 Praying Mantid, My observation of the behaviour of a, 16
 Predatory Wasps, More, 40, 72
 Presidential Inquiry, Some remarks on, 101
 Privet as a food plant, 87
 Publications received, 19, 76
 Pupa of Small White, 6
 Quick drying for Orthoptera, 63
 Quick drying for Lepidoptera, 63.
 Rambling remarks from Cornwall, 7
 Rearing the Purple Emperor in the North, 61
 Report of Hon. Treasurer for 1949, 50
 Reviews:—
 A List of the Butterflies and Moths Occurring in the Neighbourhood of Ashford, Kent. E. Scott, 92
 A Pocket Book of British Insects. George E. Hyde, 40
 Collecting Butterflies and Moths. Ian Harman, 68
 Entomologists' Gazette, Vol. 1, No. 1, January 1950. E. W. Classey and R. L. E. Ford, 55
 Handbooks for the Identification of British Insects. Royal Entomological Society of London, 82
 Vol. 1, Part 6. Plecoptera. D. E. Kimmins, 100
 Vol. 1, Part 9. Ephemeroptera. D. E. Kimmins, 100.
 Vol. 9, Part 2. Diptera. L. Coe, P. Freeman and P. F. Mattingly, 82
 Insect Natural History. Dr. A. D. Imms, 8
 Larval Foodplants. P. B. M. Allan, 8
 Patterns of Life. Alan Dale, 19
 Proceedings and Transactions of the South London Entomological and Natural History Society, 1947-48 67

The Coleoptera of Askham Bog. J. H. Fidler, 28
 The Dances of the Honey Bee. K. von Frisch, 48
 Ringlet, The, 33, 54
 Rothschild-Cockayne-Kettlewell Collection, The, 12
 Second Year Privet Moths, 16
 Secretary's Report 1949, 50
 Silver Cloud, A note on the, 89, 107
 Society for British Entomology, History of the, 89
 Special General Meeting, 49
 Stem Feeding Moths, The, 1, 30
 Strange case of the Entomologist's Heart, The, 75
 Stream in Zululand, A, 34
 Stridulation of Mutilla, 44
 Studying Evolution, 41
 Studying the Empididae, 97
 Survival factor, A, 86
 Technique

Apparatus:—

Beating Tray, How to make a, 9
 Beetle Extractor, A, 45
 Beetle Trap, A new, 10
 Breeding Cages, Larva, 11

Field Collecting Tip, 22, 52

Hints for Juniors, 29

Mould, A protection against, 19

Quick-drying method for Lepidoptera, A, 31

Springing, can it be prevented?, 22

Springing, drooping and curling, 54, 70, 96

Thecla pruni year 1950, 103

Time of emergence from pupa, 15, 87

'Twas ever thus, 92

Two suggestions, 94

'Ware Cannibals, 56

Water Boatman, A note on the, 21

Well-set Moth, The, 104

Where are we going?, 77

INDEX OF NAMES

ARACHNIDA

ARACHNIDA, 17, 32

Acarus autumnalis, 59

Belaustium nemorum, 57, 87

Belaustium quisquillarum, 58

Erythraeidae, 59

Tetranychus lapidus, 59

INSECTA

ORTHOPTERA, 62, 63, 69

Acridiidae, 62

Blatta orientalis, 93

Gryllus domesticus, 39

Leptophyes punctatissima, 73, 102, 103

Mecanema thalassinum, 73, 103

Tettigoniidae, 62

DERMAPTERA, 32

PLECOPTERA, 69, 100

EMBIOPTERA, 89

PSOCOPTERA, 4, 5

Archipsocus, 4

Bertkauia lucifuga, 4, 5

Ectopsocus briggsi, 4

Ectopsocus pumilis, 4

Embiopsocus, 4

Hyperetes guestfalicus, 5

Lachesilla pedicularia, 5

Lepinotus, 5

Liposcelis, 5

Liposcelis bostrychophilus, 5

Liposcelis liparus, 4

Psyllipsocus ramburii, 4

Reuterella helvimacula, 4

Trogium pulsatorium, 5

Mesopsocus unipunctatus, 4

EPHEMEROPTERA, 69, 100

ODONATA, 34, 69

Anax imperator mauricianus, 35

Anax speratus, 35

Aeshna cyanea, 35

Aeschnidae, 35

Allocnemis leucostricta, 35

Chlorocypha calligata, 35

Chlorolestes, 35

Crocothemis erythraea, 34

Enallagma glaucum, 34

Gomphidae, 35

Helothemis dorsalis, 34

Lestes, 35

Lestes sponsa, 108

Mesogomphus cognatus, 35

Orthetrum caffrum, 34

Orthetrum coerulescens, 34

Platycnemis pennipes, 35

Pseudagrion, 35

Sympetrum striolatum, 64

Palpopleura jucunda, 34

Trithemis, 35

HEMIPTERA, 32

Heteroptera, 32

Notonecta glauca, 21, 74

MECOPTERA, 35

LEPIDOPTERA

Acherontia atropos, 6, 13, 14, 22, 23, 31, 39

Adela viridella, 67

Aethalura punctula, 54

Aglais urticae, 6, 16, 27, 43, 57, 59, 87

Allophila aescularia, 27

Amathes c-nigrum, 19

Amathes xanthographa, 19

Amphipyra tragopogonis, 32

Anaites plagiata, 85

Anaplectoides prasina, 86, 104

Ancyluris, 95

Anosia plexippus, 3

Anthocharis cardamines, 43, 56, 76

Apamea exilis, 86

Apamea gecalis, 67

Apatele psi, 63, 87

Apatura iris, 24, 61

Aphantopus hyperantus, 22, 33, 54, 57

Arctia caja, 12, 28, 57, 67

Arctia villica, 12

Aricia agestis, 28, 43, 59

Argynnis aglaia, 70

Argynnis euphrosyne, 7

Argynnis cydippe, 76

Argynnis lathonia, 64

Argynnis selene, 59

- Asphalia diluta*, 56
Biston betularia, 41
Biston strataria, 27
Blastobasis, 67
Boarmis roboraria, 53
Bombycopsis conspersa, 71
Borolia, 71
Brachyonychia sphinx, 56, 73
Campaea margaritata, 56
Caradrina ambigua, 64
Caradrina clavipalpis, 67
Caradrinidae, 25
Callimorpha jacobaeae, 28, 53, 87
Callophrys rubi, 7, 43, 56, 76
Catocala fraxini, 12, 92
Celaena leucostigma, 102
Celastrina argiolus, 43, 56, 76
Celerio livornica, 6, 64, 96
Ceramica pisi, 72
Cerura vinula, 16, 19, 56
Chiasmia clathrata ab. *nigricans*, 67
Cirrhia icteritia, 32, 56
Cirphis, 71
Clostera pigra, 91
Coelonia fulvinctata, 13
Coeliades florestan, 71
Coenonympha pamphilus, 7, 43, 54, 59, 85, 87
Coenonympha tullia var. *scotica*, 85
Colias australis (alfacariensis), 83, 106
Colias croceus, 7, 16, 17, 18, 28, 43, 52, 64, 66, 73, 84, 91
Colias croceus var. *helice*, 18, 28, 67, 73, 91
Colias croceus var. *pallida*, 7, 18
Colias hyale, 53, 83
Colotois pennaria, 57
Comibaena pustulata, 22
Cosmia pyralina, 56
Cosmia trapezina, 56
Cossus cossus, 31
Cucullia gnaphalli, 92
Cucullia umbratica, 32
Cupido minimus, 87
Danaus plexippus, 64
Daphnis nerii, 14, 15
Dasychira pudibunda, 19, 72, 73
Dasyptilia templi, 1
Deilephila elpenor, 72, 93
Deilephila porcellus, 13
Diarsia rubi, 86
Diataraxia oleracea, 47
Dismorphia, 95
Drepana binaria, 56
Dysstroma truncata, 62
Dysstroma truncata var. *perfusca*, 62
Earophila badiata, 27
Endromis versicolor var. *lapponica*, 55
Entephria caesiata, 85
Erannis aurantiaria, 73
Erannis defoliaria, 27, 28, 73
Erannis leucophaearia, 27
Erannis aescularia, 27
Erebria aethiops, 57
Epirrhoë tristata, 85
Euchloris smaragdaria, 71
Eucloron megaera, 15
Eupithecia centaureata, 32
Eupithecia nanata, 85
Eupithecia pulchellata, 32
Euphyia bilineata, 87
Euploea, 3
Eupsilia transversa, 56
Gastropacha quercifolia, 44, 53, 96, 97
Geometridae, 12, 22
Gonepteryx rhamni, 27, 43, 73, 76
Gortyna ochracea, 30
Graphiphora augur, 86
Graptolitha ornitopus, 31
Hadena albimacula, 67
Hadena compta, 12
Hadena cucubati, 49
Hadena trifolii, 102
Heliconiinae, 95
Hepialus humuli, 31, 53
Herse convolvuli, 13, 14, 15, 31, 39, 43, 97, 107
Hippotion, 13
Hippotion eson, 13, 14
Hippotion celerio, 13, 14
Hippotion osiris, 13
Hydroecia petasitis, 2
Hyloicus pinastri, 54, 70, 93
Ithomiinae, 95
Laethoe populi, 56, 91
Laphygma exigua, 6
Lasiocampa quercus, 28
Lasiocampa quercus var. *callunae*, 86
Lasiocampidae, 12, 71
Leptocircus, 95
Leucania albipuncta, 6
Leucania contigera, 59
Leucania impura, 59
Limenitis camilla, 76
Lithosia quadra, 56
Lithophane socia, 56
Lophostethus demoliti, 14
Lycaena dispar, 50
Lycaena phlaeas, 7, 17, 43
Lycaenopsis argiolus, 76
Lycia hirtaria, 87
Lycophotia varia, 32
Lygris populata, 32
Lygris testata, 32
Lyncometra ocellata, 85
Lysandra bellargus, 27, 28, 57, 59
Lysandra cordon, 27, 28, 43, 57, 58, 59, 87
Macroglossum stellatarum, 64, 73, 87
Maculinea arion, 50, 56
Madopa salicis, 92
Malacosoma neustria, 87
Mamestra brassicae, 48
Mantola furtina, 7, 17, 43, 53, 54, 57, 58, 59, 87
Mantola tithonus, 7, 43, 53, 54, 58, 87
Mecanitis, 95
Melanargia, 95
Melanargia galathea, 57, 58, 59, 76, 95
Melanchra persicariae, 32
Melinaea, 95
Melitaea athalia, 39, 52, 66
Microsphinx pumila, 14
Mimas tiliae, 16, 96
Minucia lunaris, 12
Nephele, 13
Noctuidae, 12, 71, 72, 79

- Nomophila noctuella*, 64
Nycterosa obstipata, 90
Nymphalis antiopa, 28, 64, 76
Nymphalis io, 6, 16, 24, 27, 43, 66, 73
Nymphalis polychloros, 15, 43
Ochlodes venata, 53, 87
Odezia atrata, 64
Oecophoridae, 25
Ortholitha chenopodiata, 87
Orthosia cruda, 25, 26
Orthosia gracilis, 32, 86
Orthosia miniosa, 27
Orthosia stabilis, 27
Pachypasa bilinea, 71
Panaxia dominula, 12, 27, 41
Pararge aegeria, 7, 27, 40, 53, 59, 77
Pararge megera, 7, 17, 43, 53, 77
Parasemia plantaginis, 12, 85
Parnassius apollo, 91
Pelurga comitata, 19, 102
Peridroma saucia, 28
Perizoma albulata, 85
Perizoma blandiata, 85
Petilampa minima, 86
Pheosia tremula, 57
Pieridae, 95
Pieris brassicae, 7, 18, 40, 43, 48, 53
Pieris napi, 43, 59, 68
Pieris rapae, 6, 17, 27, 43, 53, 87
Philudoria potatoria, 18, 28
Phlogophora meticulosa, 79
Plebejus argus, 87
Plusia gamma, 59, 64, 72, 87
Plusia interrogationis, 85
Poecilocampa populi, 31, 73
Polyommatus icarus, 17, 28, 43, 53, 57, 59
Polygonia c-album, 27, 28, 43
Polyptychus, 13
Procus fasciuncula, 86
Procus strigilis, 59
Pseudophia lunaris, 92
Pyrilidae, 104
Pyrgus malvae, 53
Rhodometra sacraria, 12, 23, 24
Rhodometra sacraria var. *sanguinaria*, 24
Rhodometra sacraria var. *labda*, 42
Riodinidae, 95
Saturnia pavonia, 44, 86
Satyrus semele, 7, 43, 59
Scotogramma trifolii, 102
Sedina buettneri, 50
Senta, 71
Selenia bilunaria, 27
Smerinthus ocellata, 7, 56, 86
Sphingidae, 13
Sphingonaepiopsis, 15
Sphinx ligustri, 15, 16, 53, 55, 97
Spilosoma lubricipeda, 93
Spilosoma lutea, 57, 93
Stauropus fagi, 53
Sterrha sacraria, 12
Temnorae, 13
Temnora pseudopylas, 13
Temnora pylas, 13
Tethea fluctuosa, 44
Thecla quercus, 76
Thecla pruni, 103
Theretra, 13
Thymelicus actaeon, 59
Thymelicus sylvestris, 53, 87
Tortricidae, 25
Tortricodes torticella, 25
Triphaena janthina, 32
Triphaena prunuba, 72
Triphosa dubitata, 32
Vanessa atalanta, 7, 28, 43, 59, 64, 73, 87
Vanessa cardui, 7, 28, 43, 64, 67, 73, 87, 91
Xanthopan morgani, 14
Xanthorhoe fluctuata var. *costovata*, 88
Xanthorhoe muniata, 85
Xylena vetusta, 86
Xylomyges conspicillaris, 89, 107
Xylophasia monoglypha, 86
Zeuzera pyrina, 96
Zygaena achilleae, 86
Zygaena filipendulae, 87
Zygaena trifolii, 28, 87
COLEOPTERA, 21, 35, 40
Agabus bipustulatus, 73
Aphodii, 74
Aphodius, 58
Aromia moschata, 45, 67
Athous villosus, 74
Carabus violaceus, 73
Chrysomelidae, 73
Coccinella bipunctata, 32
Coccinella 7-punctata, 73
Coccinella 10-punctata, 73
Coccinella 11-punctata, 73
Coccinella septempunctata, 64
Coccinellidae, 32
Cyclindronotus laevioctostriatus, 58
Dineutes africanus, 35
Dytiscidae, 35
Dytiscus, 21
Geotrupes, 58
Geotrupes spiniger, 59
Geotrupes stercorarius, 58, 59
Geotrupes sylvatica, 59
Geotrupes typhoeus, 59
Gyrinidae, 35
Hister, 58
Hydrophilidae, 35
Hydrous piceus, 76
Melandrya caraboides, 58
Melolontha, 58
Mycetochara humeralis, 74
Necrophorus, 59
Necrophorus humator, 58
Necrophorus vespillo, 58
Otiorrhynchus arcticus var. *blandus*, 94
Phaedon armoraciae, 73
Phytophaga, 35
Silpha, 59
Sinodendron cylindricum, 58
Staphylinidae, 74
HYMENOPTERA, 1, 25, 35, 40, 42, 48, 58
Apis mellifica, 17
Bombus, 75
Bombus agrorum, 58, 70
Bombus jonellus, 70
Bombus lapidarius, 58
Bombus lucorum, 58, 70
Bombus pratorum, 70
Bombus terrestris, 58

- Cimber*, 11
Crabronidae, 1
Ichneumonidae, 35, 71, 72
Mutilla europaea, 1, 9, 21, 44
Pteromalus puparum, 15
Psithyrus bohemicus, 70
Urocerus, 20
Sirex gigas, 20
Vespa, 20
Vespula, 20
Vespula norvegica, 70
Vespula rufa, 70
Vespula sylvestris, 70
Vespula vulgaris, 70
 DIPTERA, 1, 25, 32, 69, 82
Aedes annulipes, 82
Aedes cantans, 82
Chironomidae, 82
Chironomus, 67
Clinoceratinea, 98
Cordiluridae, 25
Culex molestus, 82, 107
Culex pipiens, 81, 82, 107
Empididae, 97
Empinae, 98
Empis, 98
Empis livida, 99
Empis opaca, 98
Empis tessellata, 99
Frontina laeta, 75
Hilara, 98
Hemerodromiinae, 98
Hybotinae,
Larvaevoridae, 25
Microphorus crassipes, 99
Muscidae, 25
Nematocera, 81
Ocydromiinae, 98
Phormia azurea, 25
Rhamphomyia, 98
Scopeuma stercrarium, 25
Syrphidae, 25
Tachydromiinae, 98
Tipulidae, 81

VOL. 9

No. 109

JANUARY - - 1950



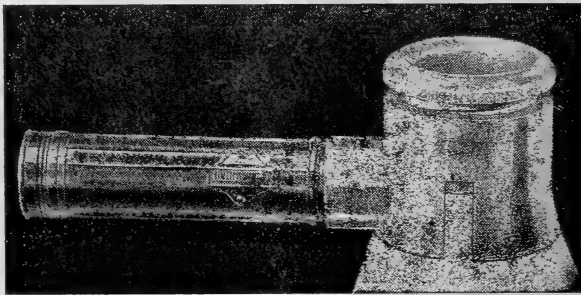
**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

EDITED by TREVOR TROUGHT, M.A., F.R.E.S.



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No. 109

BULLETIN

JANUARY 1950

BEST WISHES FOR A HAPPY NEW YEAR and
GOOD FORTUNE TO ALL OUR MEMBERS

EDITORIAL

In this number Professor G. D. Hale Carpenter and Dr E. A. Cockayne both write very strongly on the absolute necessity of putting all essential data about a specimen on a label on the pin. Numbered references to a list or catalogue are quite inadequate by themselves.

When two entomological authorities of this eminence concur about a matter, there can be no appeal from their judgment. Members, therefore, must label their captures with full data if they wish them to have any present or future value, scientific or otherwise.

MUTILLA SP.

A species of *Mutilla* was quite abundant in some parts of the Libyan desert, where I spent some years during the war. On one occasion I put my finger on a female to stop its running away, and was surprised to find that, although it made no attempt to sting, it produced a high-pitched buzz. While the sound was being produced, I could feel a distinct vibration with my finger-tip which was pressing on the dorsal surface of the insect's thorax. I was not able to detect, with the naked eye, any special movement of any particular part of the insect, which is, of course, wingless.

It is well known that some winged Diptera produce a buzzing sound while at rest; some *Crabronidae* seem also to do so, though I have always been able to see a small but rapid vibration of the wings. It may be, however, that it is not the movement of the wings that produces the sound, but that the vibration of the wings is a by-product of the movement which actually produces the sound.

P. W. E. CURRIE (977).

THE STEM-FEEDING MOTHS

No. 2: The Brindled Ochre (*Dasypolia templi*)

The illustration of this species in South's *Moths* is very poor, compared with the others. The moth when newly hatched is a fine tawny colour and is in every way a handsome and very interesting insect.

Most collectors and the majority of the text books know this moth as a definitely maritime species but there is at least one area of Yorkshire and Lancashire which has been well known for the Brindled Ochre for many years. One old collector made the following record: "Over 100 at light in Halifax—1898"; and again: "very common throughout the district, 1902." Those days are, unfortunately, over; but we have had the moth every year since the war, generally coming to light. Barrett records that almost a century ago the ardent Lancashire collectors used to cross the border into Yorkshire during the winter and take down walls, etc., in search of the hibernating moth. More than one legal dispute arose between the said collectors and the Yorkshire farmers—evidently the War of the Roses extended even to bug-hunting!

The moth is on the wing in late autumn and is generally supposed to pair before hibernation. My own experience seems to confirm this belief. The females are out again at the same time that the willows are in bloom, but although they may be taken around the willows I have never found them actually on the blossoms.

The ova are deposited in nature on the young shoots of the cow-parsnip (*Heracleum sphondylium*) but in confinement the moth will lay freely enough in a chip box. Only a few ova are deposited nightly and it would seem that, in common with other stem feeders, not more than one or two are deposited per plant.

The young larva eats into the centre of the stem, thence to the root and is not seen above the earth again until it "hatches" in autumn. In the meantime it eats an amazing amount of food and the whole of the root-stock turns to a messy pulp after its attention. It would appear to assist in keeping down the weed.

A batch of ova duly hatched and the larvae were reared in 1948. A few were forwarded to several southern members, and C. H. Hards (196) was very successful in getting results by the simple means of planting cultivated parsnip in an old box and leaving the larvae to their own devices! Personally, I found the wild foodplant the most successful and the potting method described for rearing the Butterbur (*H. petasitis*) in *Bulletin* 107, p. 82, will be found to act very well for this species also.

THE LABELLING OF SPECIMENS

By Prof. G. D. HALE CARPENTER,
M.B.E., D.M., F.R.E.S.,
Emeritus Hope Professor of Zoology
(Entomology) in the University of
Oxford.

The purpose of a collection has much to do with the method of labelling, for there are certainly two types of collectors. Let us mention the first, only to dismiss him as unworthy of consideration: the "ab-var" man. He might just as well collect match-boxes or anything else in which the interest depends chiefly if not entirely upon the *identity* of the specimen. To him, a specimen of A... b... is valuable because it has certain markings by which it can be identified and because it is difficult to obtain—and that is all! It doesn't occur to his limited outlook that there may be reasons *why* it has these markings, and other reasons, still more exciting, because they are in fact so extremely difficult to discover, *why* it is less abundant than A... c... or A... d... Such a collector, of course, has no use for the tedious business of writing labels containing (to him) meaningless facts. Let us dismiss him from our minds.

A collector with a soul, however (remember what Charles Darwin said about the purely descriptive entomologists of his day as 'a mob of naturalists without souls!'), desires that his specimens shall, in some way or other, increase *knowledge*, and that not merely his own. Therefore, he will provide with each specimen every

kind of information that may, at the *present* time, so far as he knows, result in greater knowledge of the living animal, and will possibly provide facts for which the future only can supply the explanation. It is so very easy to forget that the dead, cabinet specimen *has been alive* and subject to what we commonly call "the laws of life."

The definition of the ideal museum as "an instructive series of labels, illustrated by specimens," is very well worth remembering.

How are these data to be provided for the use of the serious student? Let the owner do as he likes *if* the collection is only to be utilised by himself—he can put any hieroglyphics he likes against or on to his specimens—and count himself lucky if he remembers what they mean!

It has frequently been my lot, when in charge of one of the most famous collections in the world, to be asked to receive the collection, from so-and-so, recently deceased, of rare and beautiful specimens. The reply always was, "I can say nothing until I have seen them." And how often did one find that on the pins was nothing at all, or an unintelligible scrawl! Enquiries might reveal that so-and-so had kept a notebook, but it had got lost. Result—the cherished collection is not accepted as of any value to science.

It is, I think, a salutary lesson in behaviour to say to oneself, "What would the world be like if *everyone* behaved as I am doing?" Think of the huge collections of the British Museum, and imagine them being run on those lines—every specimen having only a reference number to a vast catalogue to which all students would have to refer! And suppose that catalogue got lost or burnt by fire!! No—a thousand times no!—every specimen should carry not only its own identity but all available data concerning it. The first desideratum in this sentence may seem puzzling. But I am quite sure that many Lepidoptera receive sub-specific or varietal names because they come from a new locality: in other words, if the locality labels were taken off the specimens would be unidentifiable as what they are supposed to be, and if two such specimens got their data labels misplaced, their identities would be confused! A name should be given on account of a character in the specimen itself.

I wish those who feel overcome by the burden of labelling would refer to remarks on this very subject* by that great curator, Sir E. B. Poulton, for forty years Hope Professor. As a result of his care and experience the Hope Collections, of butterflies in particular, are certainly the best labelled in the world, and it is a pleasure instead of a pain in the neck to consult or refer to them. The deplorable custom of writing data on the underside of a paper beneath the specimen results in the possibility of damage to the specimen, by taking it out and replacing it, and in great waste of time and trouble. Or the label may be so close up under the body of the specimen that it can only be read by taking the label off the pin—again with grave risk to a valuable specimen. Poulton's custom, with any insect whose body or wings hid the label, was to have a duplicate label printed at the same time and pinned alongside the specimen. Thus, in a series properly arranged by geographical location, one can in a few moments grasp the source of an entire drawer, or place a certain variety as a local form or not. Similarly, a family bred from known parents (as stated on the label), with the parents specified as the source of the family, is immediately obvious. By long experience Poulton found that, in a properly devised label, it is best to place the *date* at the top. Next come localities in order of diminishing size, and the name of the captor. Any note as to circumstances of capture and ecology will, if at all abundant, probably need a second label. Each of a pair taken *in cop.*, or a predator with prey, should bear the same data label with the addition of "A *in cop.* with B" and "B *in cop.* with A"; or "A preying on B," "B prey of A"; or "A bred from B" and "B host of A."

May I, in conclusion, give examples of the loss that results from incomplete data? Poulton (*loc. cit.*) points out that *Hypolimnas misippus* has of late years invaded America and the dates of its arrival and gradual spread are of very great interest. There is a specimen in the British Museum "captured by Belt in . . . Brazil but without a date . . ." He goes on:—"What a splendid history of the gradual spread of

Anosia plexippus from its home in N. America could be deciphered from our great collections if only the collectors had troubled to put dates on their captures!"

Again—I have long been engaged on a distributional study of the genus *Euphonia* in the Pacific. Many specimens in our great museums, collected perhaps in the "good old days," simply bear the word "Solomons," as locality—and therefore are discarded as of no scientific value. For the forms on one island in the Solomons may differ markedly from those on the others, and there are interesting mimetic associations of which the chief interest lies in the fact that a certain appearance is confined to one, or two, islands of the archipelago. Doubtless in old days so little was known of this that an all-embracing locality "Solomons" (or even "South Seas"!) was considered adequate. What applied to the past applies also to the future, and we should do our utmost to ensure that the specimens we kill at least serve the purpose of providing data which may in the future reveal some new facts about life.

But—of course—a collector may not want anyone but himself to see—and understand—his collection: of him we have had enough!

October 24, 1949.

THE LABELLING OF SPECIMENS

By Dr E. A. COCKAYNE, M.A., D.M., F.R.C.P., F.R.E.S., Hon. Member AES, Zoological Museum, Tring.

I have noticed that in the recent correspondence on data labels more than one writer recommends a number on the label and a corresponding number in a book where full details of the capture or breeding of the insect are given. Those who make such recommendations have no experience of the final result of their plan. If their collections are dispersed insects with numbers on the labels will go to other collections, but the key to the numbers will not be available. The British Museum and other museums have dozens of insects with no data other than a number and they are as valueless as unlabelled specimens. Mr B. H. Crabtree used this method and his wonderful collection of moths is now scattered all over the country—those he caught and bred himself having nothing but a

* 1897, Report of Proceedings of the Museums Association, Oxford, 1897, p. 30.

number on the label. He told me himself how much he regretted having adopted this system.

I hope your members will put on their labels the place, county, exact date, and what is of minor importance the captor's name. A number in addition corresponding with that in a book giving a more complete record, can be added, if necessary.

JUNIPER HALL FIELD CENTRE

By G. E. HUTCHINGS, Warden.

Juniper Hall is one of the Field Centres established by the Council for the Promotion of Field Studies, an organization which began its work in 1945. There are now four residential Field Centres in the country, each equipped as a base for educational work and research in the field sciences—geology, botany, zoology, archaeology, etc. Each is situated in well-chosen territory where there is ready access to a variety of natural habitats.

The Juniper Hall Centre lies at the foot of Box Hill in the heart of the most beautiful country of the North Downs. The house has residential accommodation for upwards of forty visiting students, with ample laboratory and other workroom space. A large proportion of the students who come to the Centre are members of university or school classes attending courses of instruction in one or other of the field sciences. But a no less important provision of the Centre is the facilities afforded to independent students. Research workers and scientific amateurs may stay at the Centre and receive from the resident staff any advice or guidance they may need for the prosecution of their studies in the surrounding countryside. In addition, many of the courses of instruction are open to independent students, whether beginners or more advanced workers. The practical work in all such courses is adapted to the needs of individual students.

Entomologists will be particularly interested in two courses planned for the 1950 season (June 7th to 14th and July 12th to 19th) and devoted to field work in Animal Biology with special reference to Insects. The courses will be given by Mr J. H. P. Sankey, B.Sc., F.Z.S., Assistant Warden of Juniper Hall. The work will include the study of the natural history and ecology of insects, identification, methods of collecting

and the preparation of specimens. A wide range of habitats, including chalk downland, woodland, heath and inland water, are within easy reach of the Field Centre.

The inclusive cost of residence, tuition and all facilities at the Centre is £4 4s per week. Most of the sleeping accommodation is in small dormitories, but single rooms are sometimes available. Further particulars may be obtained from the Warden, Juniper Hall Field Centre, Mickleham, near Dorking, Surrey, who can also furnish information about the Council's other Field Centres.

COLLECTING PSOCOPTERA

By Dr EDWARD BROADHEAD, M.A.,
D.Phil., Zoology Department, The
University of Leeds.

(Continued from Vol. 8, p. 92)

The majority of the Corrodentia are winged, but there appears to have been a repeated evolutionary tendency in the group towards reduction or even loss of wings and also to a reduction in frequency, and occasionally to a total loss, of males. In many species there is a considerable variability in wing size and also in venation. Sexual dimorphism involving winged males and apterous females occurs in some species (*Mesopsocus unipunctatus*, *Bertkauia lucifuga*, *Reuterella helvimacula*). In others the female sex shows a dimorphism in wing size; in some of these the dimorphism is not clearly drawn, there being all gradations between the macropterous and micropterous individuals (as in *Psyllipsocus ramburii*), in others there appear to be macropterous and micropterous females with few or no intermediates (some species of *Archipsocus*), while in one genus, *Embidopsocus*, the dimorphism involves fully-winged and completely apterous females with no intergrades. Parthenogenesis is of widespread occurrence in the Order. At one end of the scale, in species such as *Liposcelis liparus*, males and females occur in approximately equal numbers, and only very occasionally will a female lay a few eggs (which are inviable) before being fertilised by a male. In *Ectopsocus pumilis*, where again the two sexes occur in equal numbers, virgin females normally lay inviable eggs until fertilised by the male. On the other hand, in *Ectopsocus brig*, virgin

females apparently can lay viable eggs although males are common. *Hyperetes guestfalicus* is a case where males are less numerous than the females and virgin females can lay viable eggs. In *Bertkauia lucifuga* males are exceedingly rare, so that the females are probably almost entirely parthenogenetic. Finally, *Liposcelis bostrychophilus* is entirely male-less, cultures of this species having been maintained for seven years without the appearance of a male. A life history study involving descriptions of the various instars and biological observations such as these, together with the results of hybridisation experiments between species of a genus, are well within the scope of anyone taking up the study of this group as a hobby and would be valuable contributions to our knowledge.

The majority of these psocid species occur on foliage and since they do not readily take to the wing may easily be collected by beating. The species living on the bark must necessarily be searched for patiently. These and the specimens shaken from the foliage on to the beating tray are easily collected by the well-known suction apparatus (shown in fig. 2).

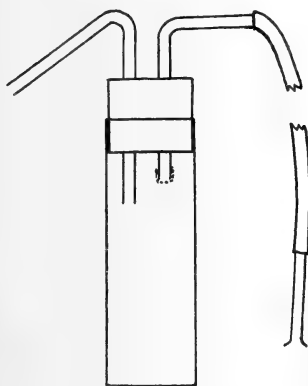


Fig. 2.

A 3" x 1" flat-bottomed glass tube is of a convenient size and if a number of these are taken on the collecting trip, the specimens need not be transferred from tube to tube. The one on the suction apparatus, with its specimens, can be removed, a little alcohol poured in if desired and corked, another tube taking its place. Besides these foliage and bark living forms, a small number of species have invaded dwellings and warehouses.

Some of these, e.g., *Lachesilla pedicularia* in houses, are probably only seasonal immigrants, and others merely accidental introductions, but some have been able to establish a permanent niche for themselves in man-made habitats. The chief of these are species of *Liposcelis* (fig. 3)

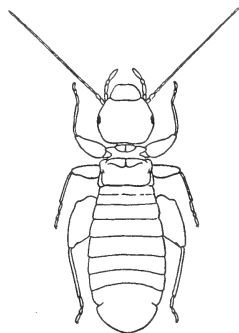


Fig. 3.

in stored foods in warehouses, species of *Lepinotus* in warehouses and in dwellings, and *Trogium pulsatorium*, perhaps the commonest psocid, in houses. It is interesting to speculate on the habitat requirements of these colonisers, requirements which, it may be inferred, are very different from those of the foliage-living forms and which have allowed so successful a colonisation. Some species of *Liposcelis* in fact are now cosmopolitan, their country of origin and natural habitat being so far undiscovered. Such a widespread dispersal may indeed have important evolutionary consequences, especially if the species concerned establish themselves in the country of introduction outside warehouses and dwellings, so producing isolated populations. At present, some data on temperature and humidity requirements of *Liposcelis* species are available, but none as yet on the winged foliage-living species. Humidity requirements may be a profitable study here. Whereas *Liposcelis* species can be cultured easily on yeast at room temperatures at 76% R.H., I have found it necessary to raise the relative humidity to almost 100% to keep some of the foliage-living species alive. This suggests an interesting study of the humidity conditions on the surface of a leaf and the correlation of this with the results of laboratory experiments on the humidity requirements of these species.

The reader is referred to an interesting article on micro-climates by A. Macfadyen in a recent number of the *Penguin Science News* (12:128).

Lastly, the author would be very grateful if readers would send any living specimens of *Liposcelis* species they see, either in houses or outdoors, to him, Dr E. Broadhead, Zoology Department, Leeds University, with place and circumstances of capture. Living specimens can be sent quite satisfactorily through the post in a small glass tube without food.

IMMIGRANT RECORDS

BASIL T. MOSS (1935), writing from Halstead, Essex, reports the taking of a Striped Hawk Moth (*Celerio livornica*), which was brought to him by a friend, whose house in that town it had entered about dusk on September 2nd, 1949. The moth is in very good condition.

W. G. TREMEWAN (1940), writing from Redruth, Cornwall, says that he caught two Small Mottled Willows (*Laphygma exigua*) on July 30th and August 8th, 1949, respectively. One was slightly damaged.

G. VICTOR DAY (29) writes from Stoke Ferry, King's Lynn:—"I have received two larvae of the Death's Head Hawk Moth. These were taken at the village of Wareham, by a Mr J. Matthews, and were feeding on jasmine. I continued to feed them on jasmine and they pupated between 1st and 6th August 1949. Nine pupae of the Death's Head Hawk have also been brought me during August and September. These were taken from potato fields at Stoke Ferry and Wretton. Two have since died, but these were slightly injured by the spinner.

"A friend, Mr John Fenn, has taken two good specimens of the White Point (*Leucania albipuncta*) at rotten apple."

PUPA OF SMALL WHITE

About ten years ago I was astonished to find a pupa of *P. rapae* that had attached itself mid-way on a withered stem of grass (an *Agropyron* sp.) in the garden in September.

So closely did its colour and markings blend with those of the *Agropyron*, that the pupa was almost invisible from a foot or two away.

O. M. WHITE (140).

THE BREEDING SITES OF BUTTERFLIES

During the past three years I have carried out careful observations on an interesting feature of the breeding habits of some of our common butterflies.

I have noticed that *N. io* and *A. urticae* show a marked preference for certain breeding sites in this district (Bishopstoke, Hants), and that the preferential use of certain patches of nettle is so well defined as to be comparable to the preference shown by birds, such as the swallow and martin, for a particular nesting site year after year.

The facts are as follows:—

Case I.—During years 1947, 1948, 1949 a web of *A. urticae* larvae occurred in the spring on nettles at one spot, not wider than 10 feet, in the length of a narrow bed of nettles adjacent to, and on the east side of, a hedge and ditch at least 150 yards long.

Case II.—In the same years extensive webs of *N. io* larvae occurred on precisely the same small patch of nettles in the middle of an open water meadow where numerous other isolated patches of nettle always occur. No other spot in this field was chosen within the years mentioned.

Case III.—Circumstances and particulars exactly similar to Case II, but the fields concerned were a considerable distance apart.

There may be very good reasons for the behaviour noted, but as yet I have been unable to attribute satisfactory answers to the questions which arise, e.g.:—

1. Are the observations a mere coincidence?
2. Have the selected sites a special positional advantage for breeding purposes which causes them to be unerringly selected?
3. Have the sites any relationship to the proximity of possible hibernation places?
4. Is it possible that a "homing" instinct exists in the female which causes her to return to the scene of her metamorphosis for the completion of her life cycle?

If the first question were correct the coincidence would be most remarkable. In regard to the second question, the possibility of the site being particularly favourable posi-

tionally might be conceded perhaps in Case I, but certainly not in Cases II and III. The water meadows are damp and open to all cold winds in spring and early summer, and nothing even suggests that the two selected nettle patches are better placed than others nearby.

Again, the proximity of a hibernation point might be conceded in Case I, but I consider any relationship of this kind most unlikely in the latter two cases.

It is quite probable that a female concerned would winter in the same district as that in which she was bred, but apart from this the last question is open to controversy.

I am not suggesting a "homing theory" for insects of this order, but it would be interesting to have the views of other members.

H. RAY (678).

● **RAMBLING REMARKS FROM CORNWALL**

It will be January before this appears in the *Bulletin* and readers will be sitting by the fire thinking longingly of Summer holidays. Before me, on a beautiful September morning, is spread a green field and cows feeding in their usual leisurely manner. Beyond is a corner of Mounts Bay, unbelievably blue, and the long line of the Lizard painted with a white wash where the sea breaks on the deceptively peaceful cliffs.

Perhaps this picture will bring back memories of sunny days in this lovely corner of Cornwall. What a country it is for butterflies!

Walk along the grassy tracks with the sea on one hand and a stone wall (called a "hedge" hereabouts) bedecked with Thrift on the other, and you will find them, hundreds of Hedge and Meadow Browns, Walls, Speckled Woods, Blues, Small Heaths and various Skippers. There will be a good sprinkling of Small Coppers and Pearl-bordered Fritillaries, and quite likely a few Green Hairstreaks. Graylings prefer more open ground, so it is on the grassy slopes, where heather and ling grow, that you will see them, appearing and disappearing with a bewildering and fascinating flick of their wings.

At the end of May came the Painted Ladies; this year they have been very plentiful. A month later there was hardly a Scotch Thistle to be found anywhere about here that did

not harbour the young larvae; such dirty feeders. By the time they had all gone, to hang themselves by the tail in some sheltered spot, the spun-up leaves of stinging nettles betrayed the presence of Red Admirals. These ravaged the nettles as earlier the Painted Ladies had eaten up the thistles. The children here always speak of Red Admirals as "King Georges." I wonder why. Is this name used anywhere else? It would be interesting to know. (*Yes, in Norfolk.—Ed.*)

Clouded Yellows, although common enough by the sea, do not seem to come inland much. One does not often encounter them on a country walk. Var. *pallida* I have taken once.

Now I must go, someone is ringing the door bell; I can see one of the village boys on the step. He will have a match-box in his pocket, which he will open very carefully to show me a moth or a caterpillar. "What is it, sir?" he will say. I know, because it has all happened before, but it is my own fault. If I had not taken a pair of Eyed Hawk Moths, some eggs they most obligingly laid the previous night, and the pupal cases, to the school at the bottom of the lane, and talked to the children about them, they would leave me in peace.

But I am glad I did; some of the boys and girls are really interested, and if I can help them, well, it is worth while.

No. 1189.

September 1949.

● **THE EMERGENCE OF A BUTTERFLY**

One day, May 20th (1949), the wing pads on a Large White pupa of mine began to develop the colour of the imago. In about two days' time, in the late afternoon, the head of the enclosed insect began to stick out, stretching the pupa case, which, after a few minutes, split. The head appeared, with the antennae still held in the pupa case by their ends. It took the butterfly about five minutes to clear itself completely from the chrysalis, after which it shook itself from side to side for about 30 seconds. The upper wings filled out and dried in about twelve minutes, with only a very slight curve remaining. The lower wings took longer, the upper edges staying crumpled longer than any other part of the wings. They were dry (very slightly

damp) and uncrumpled, in about 18 minutes after clearance of the pupa case. In about 20 minutes a pink liquid dropped from the abdomen, which until this moment had been very fat. After discharging the liquid it opened and shut its wings about three times. For a very long time after this it was wavering from side to side.

J. J. T. EVANS (1576*).

REVIEWS

Insect Natural History, by Dr A. D. Imms, F.R.S. (London: Collins, "The New Naturalist" Series, No. 8, pp. xviii + 317 + 40 col. and xxxii half-tone plates, with 8 maps and 40 text illustrations, 1947. 21s).

The standard is well maintained in this book, the eighth of the series, by the late Dr A. D. Imms, than whom no one could have been better qualified to tackle such a subject. The Editors say, in their preface, "The natural history of British insects will never be written. The subject, too vast to be treated as a whole, must be treated in part." This Dr Imms has skilfully done.

In each chapter one particular aspect of insect life is taken and discussed in clear, simple language. The first four chapters deal with structure, wings and flight, classification and senses. The rest of the book considers insects in relation to their environment. Dr Imms corrects several commonly held fallacies; the table of speeds for instance gives considerably lower speeds than have been claimed elsewhere. Throughout the book, too, some interesting queries are posed. Some of these are well worth following up and experiments could well be carried out by amateurs. In the chapter on galls, for example, he states that no instance is known in which the relations of all the insects inhabiting a gall community have been adequately investigated.

The coloured plates, mainly from photographs taken by Mr S. Beaufoy, are, as usual, excellent. In some cases the colour tends to be a little bit too brilliant, perhaps, but this is a failing of the film emulsion and in no way detracts from the excellence of the photography.

BRIAN O. C. GARDINER (225).

Larval Foodplants. P. B. M. Allan, M.B.E., M.A. (Watkins and Doncaster, 126 pages, 6 $\frac{1}{4}$ " x 4 $\frac{1}{4}$ ". Price 6s.)

In this little book, Mr Allan turns to the highly practical side of entomology and opens up a wide field of study to all those interested either in the larval stage of lepidopterous insects or in botany in relation to insects.

Before commencing to use the book I recommend the reader to read the preface carefully. It explains much which will help the younger student (I venture to suggest, the older one, too). It contains one error: Mr Allan quotes Mr Tams as the authority for the new system of English naming. It was Messrs Cooper and O'Farrell in the AES Pamphlet, *A Topic for Immediate Discussion*, who devised these names, which were incorporated in the AES Pamphlet No. 5 (*A Check List of British Lepidoptera*). Mr Tams was responsible for the Latin names of the Moths in that pamphlet.

Mr Allan has spared no pains in listing all the recorded plants on which larvae have been successfully reared. It, therefore, enlarges the practicability of rearing species often regarded as hopeless, due to the lack of the recognised foodplant. His lists can, in some cases, be extended and he seeks assistance from his readers to extend these lists in a future edition. Another very useful inclusion is the accented names of all species. This gives a good idea of the generally accepted pronunciation. In his acknowledgments, Mr Allan mentions the assistance he has received from several experts on the subject. These are well known in this particular field of study and lend considerable backing to his compilation. This very valuable addition to the rather scanty and, in any case, out-of-date literature on the subject, is, in my opinion, one of the most practical and long-needed works published for many years. No breeder or collector of the Lepidoptera can afford to be without it. Finally, I have to congratulate the publishers on making this book available to a wide public at a price within the reach of all.

H. E. HAMMOND (423).

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Exchange Notices and advertisements to: E. LEWIS, 8 Parry Road, London S.E.25. (To reach him by 15th February, April, June and September.) Also requests for literature for prospective members.

Notice of change of address to: B. J. BYERLEY, 48 Elmgrove Road, Harrow, Middlesex.

Subscriptions to: P. C. LE MASURIER, 85 Warren Drive, Totworth, Surrey.

Offers to lead field meetings, exhibit, etc., to: D. P. GOLDING, 517 Foots Cray Road, New Eltham, London S.E.9.

Applications for new membership to: S. M. HANSON, 167 Gunnersbury Park, London W.5. Also offers of help with AES work, and suggestions for improvements in our organization.

Silkmoth Rearer's Handbook. Data for the revised issue to: W. J. B. CROUCH, 5b Stanley Crescent, London W.11.

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AES NOTICE

1950 SUBSCRIPTIONS

In 1949 the Society sent the *Bulletin* for nine months to scores of members who had not paid their subscriptions. To these members, a final notice was sent instead of the October *Bulletin*, with the result that those members who had merely overlooked payment, paid up; but there are still people who have received the *Bulletin* for nine months and not paid.

The Society cannot risk this financial loss—the actual cost of putting one copy of the *Bulletin* in a member's hands has increased a lot—so this year, the final notice will be sent in place of the APRIL *Bulletin*.

But would it not be better to avoid this dislocation and all the unnecessary trouble it causes to so many people and

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Accommodation is available for eight students. For all further particulars apply to—

The Warden, Dale Fort Field Centre, Haverfordwest, Pems.

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OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY

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EDITED by TREVOR TROUGHT, M.A., F.R.E.S.



NOTICE TO ADVERTISERS

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ATTENTION ALL LEPIDOPTERISTS!

HELP WANTED IN LONDON

Are there *ANY* AES lepidopterists in the London area who would be willing to contribute something of value to the Home Counties fauna list and at the same time enjoy an inexpensive day out? I am appealing as the Survey Secretary of the Hampstead Scientific Society. We are assembling and eventually publishing check-lists of the fauna of Hampstead Heath in all the Natural Orders. We've got hymenopterists and beetle collectors; a bug hunter (hem-het) is hard at work, and so are several other specialists, but lepidopterists are as rare as Mazarine Blues. We can't promise you anything positively breath-taking, but micros abound and we have a fair number of Emeralds. There are many exciting and unsuspected specimens to be taken by the diligent. We welcome entomologists of all kind but lepidopterists are especially wanted at the moment. Would someone care to take over the organization of this Order for us? The bibliography is reasonably extensive. Write or phone me. The address is 85 Cholmley Gardens, N.W.6. (Telephone Hampstead 4626).

JOHN HILLABY (1492).



EDITORIAL

In this number, we are privileged to print an article by Dr E. A. Cockayne, one of our few Honorary Members, on the Rothschild-Cockayne-Kettlewell Collection, which is housed for the time being in the Museum at Tring. The Editor has had the pleasure of visiting the Tring Museum, under Dr Cockayne and Dr Kettlewell's hospitable auspices. He was astounded at the scope of the Collection: but it was impressed on him that there is room for still more. So if any member is giving up collecting—and, in the ordinary course of time, we all give up collecting—and would like to be certain that that lovely variety of *This or that*, the pride of our heart, is properly housed and put where moth and rust will *not* corrupt, let him offer it to the National Collection, preferably now, but certainly before it is too late. It is one of the tragedies of collecting that so much is made useless by lack of forethought.

Junior Members are, of course, just as likely to get a rare variety as anyone else. It is sometimes just a question of luck. They also should think of the National Collection, if, as they grow older, the hurly-burly of life leaves no time for entomology, and pass on their "extra-specials" to the National Collection.

The Editor can also tell members (as he practises what he preaches) that the Trustees of the British Museum send a very handsome acknowledgment of any "Present" they receive.

MUTILLA EUROPAEA

I was very interested to see the notes published by Mr B. L. J. Byerley and Dr K. G. Blair in *Bulletins* Nos. 105 and 107, pages 68 and 84, respectively, concerning *Mutilla europaea*, which I encountered for the first time in the New Forest in June 1948. Between the heavy showers, it was sometimes possible to collect in the better drained parts of the Forest, and I was very fortunate in taking three females in a sandy

hollow near Beaulieu Road. I failed to find a male, although I dug out what I took to be the insect's tunnel in a sandy bank. I also failed in my attempt to keep any of the three alive in captivity for more than a few hours. Has Mr Byerley, or any other reader, noticed the powerful manner in which this insect stridulates when alarmed, audible for a distance of three or four feet?

C. MACKECHNIE JARVIS (650).

With reference to *Mutilla europaea* it is rare, but very widely distributed, on the moorlands to the north of Scarborough and, in its haunts, can usually be found, especially in August. In the *Natural History of the Scarborough District*, now in the press, we have the following records:—

Ellerburn Moor (W. Pearson), Robin Hood's Bay (F. Elgee, T. Stainforth, numerous records), Lilla Cross (E. Arnold Wallis), Wykeham Moor (M. Pittam), Stony Marl Moor (G. B. Walsh). Both males and females have been taken.

G. B. WALSH (24).

HOW TO MAKE A BEATING TRAY

Having found that a beating tray is as essential to the Coleopterist as to the Lepidopterist, I decided to make one, but was unable to find any useful published instructions. I therefore designed my own, on the basis of those I had seen my friends using. Since my tray proved quite efficient during the past season, my experiences may be of use to other members.

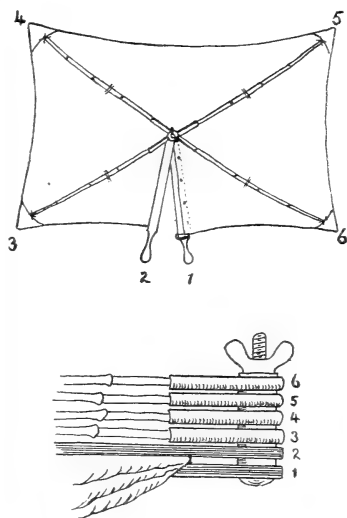
The following materials are needed:—Black cloth 40" × 32", two pieces of hardwood (preferably ash) 22" × 1" × $\frac{1}{4}$ ", four bamboo stakes about 30" × $\frac{3}{8}$ ", one 3" × $\frac{1}{4}$ " coach bolt with a wing-nut and six washers to fit, ten inches of $\frac{3}{8}$ " bore brass or aluminium tubing, a few tacks, etc.

Cut the metal tubing into four equal lengths and force over the larger end of each bamboo stake. Drill a $\frac{1}{4}$ " hole through the tubing containing the bamboo, about $\frac{1}{2}$ "

from the end. Drill a hole similarly in each hardwood strip, the other end of which is shaped to form a handle as illustrated. Pass the bolt through the holes in the two hardwood strips and each of the stakes, inserting a washer between each and the next; finally add the wing-nut. Knock down the last few threads of the bolt to prevent the nut from screwing right off.

Hem the cloth all round and sew small triangular pockets to each corner. Make a cut from the central point of the cloth to the middle of one of the longer sides. Make a narrow hem on these raw edges, finishing off their juncture at the centre with button-holing. Tack these central hems to the two hardwood strips, one being above the cloth and one below, the button-holing passing round the bolt.

With the two handles held together, stretch the cloth out along each bamboo stake as far as it will go. Mark this position on each stake and check that they are all equal. Cut off the waste bamboo and insert the ends into the pockets. A $\frac{1}{8}$ " hole can be drilled through the bamboo at the edge of the pocket and the cloth stitched through this. Further stitching to the cloth round the bamboo, half way down, also helps.



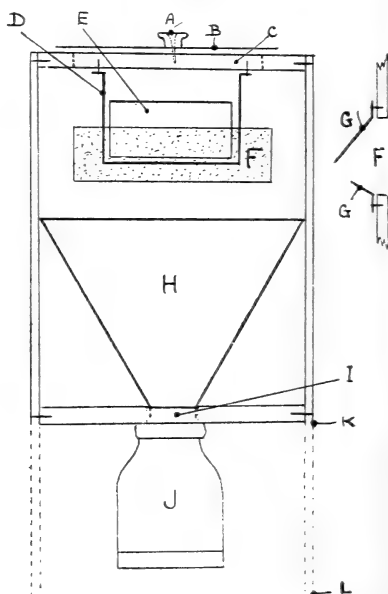
The tray is much improved by slightly curving the bamboos upwards at the outer edges to form a cup. This can be done before assembly, by

heating the wood in front of an electric radiator. Also a U-shaped piece of brass strip can be attached to one of the handles, for the other one to slip into. They will then stay together when not being held. The order in which the stays are assembled on the bolt is shown in the diagrams. This must be adhered to or the tray will not fold neatly. The wing-nut can be screwed up when the tray is open and helps to hold it rigid. I made my tray of utility blackout cloth, but find that this is a little rough and difficult to shake clean. Some people make a tubular cloth cover for the tray to slip into when folded.

J. H. FIDLER (1256).

A NEW BEETLE TRAP

Those who collect coprophagous and necrophagous insects will probably find the trap here described of interest and practical value. It is rather an unpleasant business picking out beetles from dung and carrion, so to obviate this I devised this trap, which certainly works very well with carrion. So far, I have been unable to try it out with dung bait, but it will surely be equally effective.



It consists of a wooden box, the bait being contained in a tin tray E which

is suspended from the lid C by means of strips of baling iron, bent into shape as shown at D. H is a metal funnel, the apex of which leads into the killing bottle J. The insects enter through a "post-box" slot in each of the four sides (F). These slots are guarded on the inside by strips of wire gauze or perforated zinc, bent and nailed as shown at G. Once inside the trap the insects find it difficult to get out again, and in attempting to escape, usually drop down the funnel into the killing bottle.

In constructing the trap, it is advisable to make the pyramid-shaped funnel first, and for this I used the tin lining of an army biscuit box. A good size seems to be about 10" at the base and 2" at the apex, leaving about half an inch projection here to allow for bending and fitting to the baseboard I. The baseboard is cut the same size as the base of the tin funnel (10" square) and in the centre of this is cut a square hole to admit the apex of the funnel, which is held in position with small nails.

The next step is to prepare the sides and fit the wire gauze guards over the slots, and screw the sides in position round the baseboard and funnel. Then cut a square piece of wood the same size as the baseboard, for the top. Mark out on this the position of the lid and, after drilling a hole in each corner, cut out the square with a key-hole saw. This forms the lid C with the addition of a piece of tin which is nailed to it, and which overlaps each side by about half an inch. A half cotton reel screwed to the centre of this makes a serviceable handle. Baling iron strips D are bent to shape to hold the bait tin and fixed to the lid, and the top of the trap is then nailed in position.

A square hole 2" diameter is then cut in the lid of the killing bottle, which is nailed or screwed in position below the baseboard, and the trap is complete.

If desired, two of the sides can be made longer than the others (KL) to form legs, or a smaller box can be used as a stand. It is advisable for the killing bottle to be exposed to the light on at least one side, as it induces the insects to seek that way of escape.

A. L. CAPENER (6).

LARVA BREEDING CAGES

I have seen no recent mention of a device which I think I first learnt from an earlier issue of the *Bulletin* and which I have used successfully for some years. This consists of a cellophane bag, made by folding a rectangular piece of cellophane cut edge to edge, and binding two edges with adhesive cellophane tape (fig. 1).

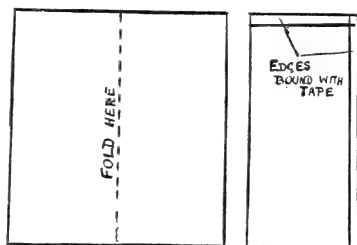


Fig. 1.

The food plant can be introduced through the open end, leaving sufficient of the stem protruding to enable it to be stood in water. The open end is then gathered together and tied with string.

A few holes should be made in the bag by pricking it with a fine pin while lying on a flat surface. This prevents condensation — cellophane becomes soft and flabby when damp. I must admit that this method is suitable only for plants with fairly strong stems; but for these it works admirably. The plants keep fresh for much longer than they do if freely exposed to the air.

The open end can be opened from time to time by untying the string, to empty out the frass which collects at the bottom of the bag or to introduce a fresh sprig of the food plant to which the larvae will readily migrate. I have used this method for sawfly larvae, most of which are fairly small, though some (e.g., *Cimbex* spp.) are $1\frac{1}{2}$ " or more in length. It is particularly useful when one has a few specimens of each of a number of species, as the larvae of each species can be kept in separate bags—there is no limit to the number of bags one can make, and they can be thrown away when they become soiled. Species which normally spin up in dead leaves or debris often do so in corners of the bag, where they can be left till they emerge. I have only once had larvae bite holes in the bag; in this case I had omitted to notice that they were ready to pupate. As long as

they are feeding they seem to be content to remain in the bag. As the cellophane is transparent, it is easy to keep the larvae under observation.

P. W. E. CURRIE (1977).

THE ROTHSCHILD-COCKAYNE-KETTLEWELL COLLECTION

By Dr E. A. COCKAYNE,
M.A., D.M., F.R.C.P., F.R.E.S.

It may interest AES members to be told about the above Collection—its past, its present and proposals for the future. It is a National Collection, and, as such, is of interest to all British Lepidopterists, each one of whom can use the Collection for study and also, by offering it rare and aberrant forms, help to improve it.

Some years before the war Dr Bernard Kettlewell (706) suggested to me that we should work together. He said he would hand over his collection of butterflies and moths to me and go on catching and breeding Scarlet Tigers, Wood Tigers, and other species to add to it, while I was to continue collecting and buying rare aberrations and local races at sales. Already, in the opinion of the late L. W. Newman, I had the best private collection of moths in the country, and the joint collection would soon be far the greatest outside the British Museum. [There would, however, be many better collections of butterflies.] After careful consideration I agreed.

We then discussed its ultimate fate and both were determined that it should never be broken up as we had seen happen so often. We both thought it ought to go to the British Museum, but we wanted to make sure that it would be well looked after. Negotiations were started with the Trustees and after some time an agreement was drawn up, but we were not altogether satisfied with it and after talking it over from time to time decided, after a year, not to sign it. I then saw the Keeper and suggested that the joint collection should be handed over at once, if the Trustees would agree to certain conditions. He said he was sure they would be very glad to fall in with our wishes, and soon afterwards a new agreement was drawn up and signed.

Its provisions allowed Dr Kettlewell and myself to amalgamate the whole of the Collections of British

Macrolepidoptera both at Tring and in London, the Rothschild, Bankes, Robert Adkin, Christy, and others, with ours, the amalgamated collection to be known as the Rothschild-Cockayne-Kettlewell Collection. We on our part undertook to carry out the amalgamation and arrangement designed to show the variation of each species, general and geographical, and the genetics of the different forms so far as they are known. As far as possible the forms and races are named, and the authors' names and references to the original descriptions are given. References to accounts of the genetics are also cited. We also undertook to add to it any specimens caught, bred, bought or presented, which we thought would increase its scientific value.

We were given permission to describe and name any forms which we thought worthy and are allowed to have photographs taken by the official photographer. Types, gynandromorphs, examples of homoeosis and so on are not to be removed from the collection, which is to remain at Tring during my lifetime, but will probably be removed to South Kensington eventually and housed in a special room in the new building.

Since our collection was handed over we have added a wonderful series of *Sterrhia* (*Rhodometra*) *saccharia*, the Vestal, a number of *Minucia lunaris*, the Lunar Double Stripe, and some *Catocala fraxini*, the Clifden Nonpareil, bred by Dr Kettlewell himself or from eggs obtained by him, and I hope we shall soon be able to show a series of *Hadena compta*, the Varied Coronet, a result of my recent visit to Kent. By selective breeding for many years Dr Kettlewell has obtained a hitherto unknown form of *Panaxia dominula*, the Scarlet Tiger, and a new form of *Arctia villica*, the Cream-Spot Tiger; and I have purchased a large number of rare aberrations at sales, including the whole of the *Lasiocampidae* from the B. W. Adkin collection. We have also received valuable gifts from well-known entomologists in all parts of the country, including a number of AES members—among them a magnificent aberration of *Arctia caja*, the Common Tiger, bred by an AES member.

So far the whole of the *Geometridae* and about a quarter of the *Noctuidae* have been arranged and the amalgam-

ation is proceeding apace. Visitors and students are welcomed, but it is advisable to write and make an appointment beforehand.

COLLECTING SPHINGIDAE IN SOUTH AFRICA

In view of recent articles dealing with collecting activities in various parts of the world, I feel that some details of South African Hawk Moths may prove of interest. In spite of the large numbers of collectors interested in this family of moths I doubt if many are acquainted with species occurring in this country.

My own study of these moths only commenced about six years ago, but I have been fortunate in being able to collect and rear a large proportion of the 60 odd species occurring here. In this connection I would like to express my own debt of gratitude to the late Mr H. W. Bell-Marley of Durban and to add my tribute to that given by Mr L. S. Whicher, F.R.E.S., in his article (*Bulletin No. 100*, p. 22, and *No. 101*, p. 31) on Coleoptera Collecting in South Africa.

Mr Bell-Marley had an amazing knowledge of South African Natural History in all its branches, and to him I am indebted for my knowledge of many foodplants and localities in Natal for both butterflies and moths. He gave me unstinted help and encouragement and his untimely passing was a great loss to all who knew him.

As I have said, about 60 species are found in the Union and of these the majority occur in the sub-tropical regions of Natal and Zululand. The Cape Peninsula can only boast of 14 species, although there may be more, as no collector appears to have investigated this area thoroughly for *Sphingidae*. The Central Plateau with its vast open veldt and cold winters is also not productive of many species nor great numbers: extensive veldt-burning has no doubt thinned out those that do occur.

Contrary to what one would expect, South Africa does not possess many large or brilliantly coloured species: by far the greater number are fairly small or only of medium size. Twenty-nine genera are represented, those with the most species being *Temnora* (9 species), *Hippotion* (7 species), *Poluntuchus* (6 species), *Nephele* (6 species), and *Theretra* (4 species).

The rest can show only a single, or occasionally two species.

The *Temnora*e are all fairly small moths, roughly the size of the British *D. porcellus* (Small Elephant Hawk) or even slightly smaller than that. They are all rather dull coloured, though the only 2 species found around Cape Town (*T. pylas* and *T. pseudopylas*) have orange-yellow lower wings. In their localities they are common, and eggs can easily be found on young shoots of the foodplant. The larvae are all rather similar, and in one instance 3 species feed on the same shrub, which is helpful when rearing them. In all cases a rough cocoon of leaves is formed, usually at the roots of the foodplant. They fly at dusk, and seem especially fond of the flowers of *Lantana* ("wild currant").

The *Hippotion* group is known to British collectors by virtue of the rare *H. celerio* (Silver-Striped Hawk). This particular moth must be one of the commonest in Africa. At certain times I have seen them in enormous numbers around street lights in Durban, usually accompanied by the closely-allied *H. eson*. They feed on two different types of plants, namely, Arum lily and grape-vine (both wild and cultivated). We also have *H. osiris* occurring in Natal; this moth reaches as far north as Spain. It resembles *celerio* on a larger scale.

A. atropos (Death's Head Hawk) is found all over Africa, and is fairly plentiful, the larvae feeding on at least a dozen different foodplants. *H. convolvuli* (Convolvulus Hawk) is also very common everywhere (in fact, the larva is classed as a pest in Portuguese East Africa owing to its denigrations in the sweet-potato fields) and at certain seasons, in Durban, I have seen the moths resting on poles of street lights, almost from the pavement to the light itself, packed like sardines and almost overlapping each other. They vary considerably in the upper-wing markings and also in size; some very small specimens occur at times, no doubt due to drought conditions. We also have another moth, which seems almost intermediate between *atropos* and *convolvuli*. This is *Coelonia fulvinotata* Butl. It is close to *atropos* in the dark colouring of its upper wings, and also the larva is almost identical with that of *atropos*, with the sole exception of the horn. It also eats the same plants, and

makes a similar crackling sound when annoyed. The pupa, however, is more like that of *convolvuli* with the "pitcher handle" proboscis sheath. It is a very attractive moth and fairly plentiful everywhere.

This article would be incomplete without mention of our largest and also our smallest Hawks! The largest, from a "bulk" point of view, is undoubtedly *Lophostethus demolini* Angas. Wingspan of over 6" and a massive body. It is predominantly fawn-brown in colour with a wide chocolate band across each upper-wing, but the most striking features are two peculiar shining-white markings on each upper wing. One is a clearly shaped arrow pointing towards the base of the wing, and just beyond its point a round spot. It is from this mark that its nickname of "Arrow Hawk" arises. I once reared 3 larvae of this moth and it was as much as I could do to keep pace with their appetite, more especially as the foodplant was of the type that wilted almost as one cut it, to say nothing of the fact that I only had one small room at the time and had to share it with them, and several other odd larvae! They reached mammoth proportions, about 6½" long and about 1" thick, pale whitish green and with rows of forked spines along back and sides, as well as the usual horn. In their natural surroundings they are rather conspicuous (I have been told it is possible to spot them from a car), and no doubt their size and spines alone save them from extermination.

Another large Hawk (not so bulky and far more graceful) is *Xanthopan morgani* Wlk. This has the greatest wingspan of any in South Africa, a female I possess spans exactly 6½". The forewings are a combination of fawns and greys, the hindwings dark brown with wide bands of orange-yellow radiating from the base. It is a rare moth, apparently only to be found on the Natal and Zululand coast, and I have never seen the larva, although I am informed that it has a "mane" of fine white hairs on the back. By an extraordinary stroke of good fortune I actually picked up a perfect moth on the pavement of a Durban street one morning about 10 o'clock. Passers-by walked all around it, and how it survived is a miracle. I shall not easily forget my excitement when I realised what it was, but this was not

the end of the story, as exactly a week later I picked up another, a female this time! They had been apparently attracted by street lights. Needless to say, up to the day I left Durban I walked around gazing about hopelessly, but did not find another.

In Durban enormous numbers of moths are attracted by street lights, and it used to be a habit of mine to walk up and down certain streets before breakfast, equipped with several killing-bottles and a large paper bag to accommodate a possible overflow! I did extremely well in this way.

In due course, however, another enthusiast and myself discovered an even better place at the top of the town. This was on a railway bridge and for some reason Hawk moths swarmed around two or three street lights on the bridge on certain nights. I should imagine that these lights happened to be directly in the path of migrations of moths from the Bluff northwards. Moths were literally there in hundreds, *H. convolvuli* easily the most common, but *H. celerio* very close, and altogether I suppose we found well over a dozen species around those lamps, including *A. atropos*, *D. nerii*, *H. eson*, and *B. medea*. Our chief "competitors" were bats, and the roadway was strewn with wings of unlucky moths. Any moth that fell to the ground injured or tired was immediately torn to pieces by hordes of large black ants. Of course, not only Hawks came, but also hundreds of Noctuids and often some of the larger Saturniids. We were usually there until well into the early hours, and such nights played havoc with one's eyes (from the glare of the lights) and also one's capacity for work the following day!

Now, about the smallest South African Hawks. The very smallest is a day-flying moth called *Microsphinx pumila*. It has silver-grey upperwings and bright yellow underwings, resembling on the wing a yellowish wasp, being only ¾" across its wings. It seems confined to the mountainous areas, occurring fairly plentifully on the Drakensberg Mountains in Natal, but around Cape Town it is very rare, and I have only a single specimen taken on Paarl Mountain, some 30 miles inland from Cape Town, where it was flying around flowers of heath. I don't think the foodplant is known.

Two other "micros" of the Hawk family bear a generic name longer than their own wingspan, namely *Sphingonaepiops*. They are both sombre coloured moths and superficially resemble noctuids.

Apart from *D. nerii* (which is also fairly plentiful in the coastal regions) the most brightly coloured is undoubtedly *Eucoron megaera* Linn. This handsome insect, being about the size of *convolvuli*, has rich green fore and bright yellow hindwings marked with red-brown. I know of no other Hawk so brilliantly coloured and, unlike *nerii*, specimens do not fade in the collection.

In conclusion, I might add that no collection, however attractive, is enough in itself, and in South Africa a lot of work has still to be done on life-histories, even on the Sphingids. I am hoping to do some work on these lines down here in Cape Town, where the small number of species available do not tempt me to spend all my evenings on "sentry duty" beneath a row of street lamps!

A. J. H. DUKE (97).

ABSTRACT

Notes on a Brood of *Nymphalis polychloros* L. by Commander G. W. Harper, R.N. (Retd.) (1169). *The Entomologist* 82: 185 (1949).

A female *N. polychloros*, caught in West Sussex on April 17th 1948, laid 108 eggs in a single batch three-quarters of the way round an elm twig, about $\frac{1}{2}$ " diameter, between 9.30 a.m. and 11.30 a.m. B.S.T. the next morning. These were cream-coloured when laid, becoming pale brown in 48 hours. They darkened to a deep purple with a pearly gloss about May 6th. The twig bearing the ova was then suspended horizontally, between the forks of a twig of broad-leaved sawtooth on one side and elm on the other, equidistant $\frac{3}{4}$ " from each.

On May 10th all ova except one hatched, and in the afternoon the young larvae marched to the sawtooth twig and massed on a single leaf. They were thereafter fed on sawtooth. No tent was constructed, but a silken carpet was spun wherever the larvae moved, which seemed to serve as a foothold. All larvae changed skin on the 17th May; the second moult occurred on May 23rd; the third on May 30th; and the fourth on June 7th and 8th. The larvae were still gregarious in their last

instar and were noted to re-act to sound by jerking the front part of the body in unison. This gregarious habit caused a number of larval deaths due to interference at ecdyses.

On June 16th the larvae began pupation, which was completed by June 20th, and emergence took place from July 16th to 23rd. A typical emergence is described. After emergence, the imagines remained inactive; sunshine induced some lazy basking.

BREEDING THE LARGE TORTOISESHELL

I had a small batch of *Nymphalis polychloros* ova sent to me in 1949. These, when due to hatch, were sleeved on a young growing spray of elm in the garden. For this I found the top end of a lady's silk stocking, held out over a simple wire frame and tied at both ends, made a very suitable cage. However, when the larvae increased in size, they were placed in a larger and less finely-woven sleeve, where, after just over 30 days, they became pupae. The very next day the whole sleeve was brought into the house to be "out of harm's way," but all too late. A small hymenopteron was discovered standing, one to each, on nearly all the pupae. These were all caught at once, but after the usual period of waiting, 8 pupae failed to produce butterflies, instead from these emerged 695 parasitic chalcids (*Pteromalus puparum*) in the proportion of 298 females and 397 males. This species was identified for me through the British Museum (Natural History) by Mr G. J. Kerrich (551), who mentioned that *P. puparum* has also been found to attack the pupae of other Nymphalids and some Pierids too.

P. J. GENT (192).

TIME OF EMERGENCE FROM PUPAE

Are there any comprehensive records of the time of day at which Lepidoptera emerge?

My Privet Hawks always emerge about or after midday but I have no recollection of a Poplar Hawk emerging at any time except during the night or early morning. Other species which I have recorded have emerged at all sorts of times. Vere Temple states that the normal time

is early morning or late evening (I write without being able to verify the quotation) and this may be true in a state of nature, but it is not borne out by my captive specimens which are all kept in an unheated wooden garage.

L. S. BEAUFOY (628).

SECOND-YEAR PRIVET MOTHS

I have had a similar experience to that of Mr Peter Michael (748), reported in the October *Bulletin* (Vol. 8, No. 106, p. 77).

In 1947 I had seven *ligustri* pupae, all from ova laid by one female. The moths emerged as follows:—1948—June 15th, female; June 26th, female; June 30th, male; July 2nd, male and female. 1949—June 26th, male and female.

I have had similar results (some individuals of the same brood wintering once and others twice) with Puss Moth (*Cerura vinula*) and Lime Hawk (*Mimas tiliae*).

L. S. BEAUFOY (628).

MY OBSERVATION OF THE BEHAVIOUR OF A PRAYING MANTID

The praying mantid owes its name to the praying position of its form. The head bends low and a pair of enlarged forelegs in handclasping position as if in prayer. Mantids frequent farms and gardens from the beginning of the rainy season at about May right to the end of October. The colour of the insects always matches with their surroundings; the green body and the green leaves make no difference and hardly could the creature be detected. In October morning last year, I observed a mantid on a green plant keeping quite still and I wondered what happened. At the very moment I discovered a grasshopper was coming round its way. It appeared the mantid had exercised a very powerful influence over its prey. It cast a penetrative steady gaze with its eyes over the poor grasshopper. The grasshopper became hypnotised and paralysed, then stupefied and motionless. Immediately, the insect hunter moved forward its well-armed powerful weapon, the pair of forelegs, and got hold of the unwary thing. What a sad and unexpected end the grasshopper met with.

The Mantid
a friend of the farmer



The Grasshopper
an enemy of the farmer

The mantid is a flesh eater and also a terror to the insect world as a lion is to the animal world. But then on the other side this fearful insect is a farmer's friend. It attacks grasshoppers, the farmer's enemies that destroy the leaves of the crops.

NKO O. IKA (1423*).

BREEDING THE CLOUDED YELLOW

G. A. SMITH (942*), writing from Bramford, Suffolk, on September 1st 1949, in reply to the Editor's call for copy, says:—"Three or four weeks ago I caught several Clouted Yellows (*Colias croceus*) in a lucerne field near here—two or three females and several males. These I put in a makeshift cage, leaving them for several days (in the sun when possible) feeding them once a day on syrup made from sugar. About two weeks ago one female started to lay, so I let the others go. The eggs (orange, laid singly or in twos and threes all over the foodplant) hatched five to eight days later, and I now have twenty or thirty young larvae. Will these live over the winter safely if I can get food for them? (Advice was sent to Mr Smith on this point at once.—Ed.) I made the cage out of three cardboard boxes, some string, pins and butter muslin.

POPULATION NOTES

Butterflies. It would be interesting to hear the experience of other members as to the scarcity of butterflies this (1949) autumn, especially *Vanessids*. In 1948 that family was badly parasitized, and in the spring (1949) I was unable to find a single colony of *Nymphalis io* or *Aglaia*

urticae, whereas I usually have no difficulty in finding five or six of *urticae*. In my garden during August and early September I have never seen more than four *Vanessids* on *Buddleja*, a fair number of *Pierids*, mostly *P. rapae*, and a few *M. jurtina*, *P. megaera*, *L. phlaeas* and *P. icarus*.

C. croceus is scarce, and on three or four visits to a nearby cloverfield I have seen no more than three (? four) specimens, all males.

G. N. BULL (160).

COLLECTING SPIDERS' WEBS

I have no doubt as to the nature of the criticism of this article. The housewife will wonder why anyone would want to collect webs; the entomologist will think that I am indeed a poor entomologist for attempting to have an article on spiders printed in an entomological publication.

The idea of preserving spiders' webs came to me when I realised the beauty and detail which were to be found in them. It was necessitated by my inaccuracy in drawing them.

My first attempt was to try to preserve the webs on paper; but no matter what coloured paper I used, they could not easily be seen. I tried colouring the webs by spraying with coloured inks but this was not successful.

The method which I finally devised is to obtain the web on a sheet of glossy, non-absorbent paper. This is easily performed by merely pushing the paper against the web until any attaching strands break. If some diluted ink is placed in a saucer, the paper on which the web is can be submerged by a method similar to developing films. When these "prints" are left to dry (hanging gives the best results), the outline of the web remains even when the web is brushed off. Probably capillarity attracts more ink to the position of the web, thus giving a darker region. Usually the web remains in the correct position throughout the whole operation. The relative thicknesses of all parts of the web are brought out.

In another method the paper is glued slightly before obtaining the web, but the outline is much fainter; and here care must be taken not to "develop" before the glue is dry, otherwise the web floats and thus becomes displaced.

Both of these methods I have found to be most reliable.

PETER A. GAY (1393*).

(Considering the interest spiders take in most orders of insects, the publication of this article seems justified.—Ed.)

BEEKEEPING Spring Manipulation

Now that the turn of the year has passed, beekeepers will be turning their thoughts to the coming season—how their bees have wintered and what the chances will be, given good weather, of a good honey harvest.

Most beekeepers of a few years standing will realise that the season really commences in the previous autumn, with the preparation of the colony for the winter—namely, that the colony is queen-right with a good young queen, the colony is disease free, that ample stores are provided and the hive is in a good state of repair. If these items are attended to in autumn and precautions against attacks by mice put into effect, there is every reason to be satisfied that the colony will winter well.

The point is what we can do *now* to help our bees to build up a colony of sufficient strength to take advantage of an early nectar flow.

The queen usually commences to lay slowly towards the end of January and in February. About this time plenty of warm dry quilts or sacking should be placed over the colony and the entrance of the hive (which should have been wide open during the last three months) should be closed up to an inch or two, to enable the colony to conserve heat for breeding. The bees should not be disturbed and the hive roof should be taken off as little as possible to allow no heat to escape. Examination should be made from time to time to ensure no damp is entering the roof, and damp packing should be replaced. It is well, however, some time in February to peer under the quilt, without taking it off, to see if sealed stores are present. If capped honey is seen at the top of the frames, replace quilt immediately. If stores are known to be short, soft candy should be given over the cluster until warmer weather towards the middle of March, according to season, makes syrup feeding safe. It is better, however, to feed syrup in the autumn so that the bees will

have sufficient food, than to have the uneasy feeling that the colony may be short at this time of the year.

Make sure you have a windbreak to the prevailing winds and that no strong winds blow directly on the entrance. A hedge cannot be beaten in this respect as it lets a certain amount of air through, but fencing of the wattle type is good. A brick wall is not good as it is rather a sun-trap and tempts bees out to fly when the surrounding air is not suitable, resulting in some loss of valuable bee lives.

Bees need water for breeding, and this should be provided with a little salt added. Place this in a sunny position, not too near the hives, so that the bees will not soil it, during their cleansing flights. This should have been in position in the autumn, as the bees locate their drinking place then, but if provided now, some are sure to find it. An old sink, sunk in the garden, filled with pebbles and flooded is a good idea for this.

(To be continued)

D. M. JESPER.

OBITUARY

It is with great regret that the death of Mr Charles King Smith (159) of Bitton Hill, Bristol, is reported. Mr King Smith was 87 years of age and had been chairman of a private paper-making company for a long time. He was a keen collector of moths and butterflies, but also found time for much public service, as a Justice of the Peace, a President of the Western Division of the Y.M.C.A., and a Rural District Councillor.

He retained his enthusiasm for entomology right to the end—it was only a few days before his death that in response to the Editor's appeal for copy, he wrote that he could not report any special finds, but that he had taken two of his grandsons out, lent them nets and captured Clouded Yellows. Let us hope that he has handed on the torch of entomological curiosity to the rising generation. He was a kindly man, and will be greatly missed by his family and friends.

NOTES AND OBSERVATIONS

A very late appearance of *Colias croceus* is reported by the late C.

KING SMITH (159) in 1947. He wrote:—"Two years ago, when *croceus* was common, I could find nothing but males until October, when the sexes became about equal. Just outside my window here (Bitton Hill, Bristol) I also netted one var. *pallida* and one *helice* and boxed two males on November 23rd.

R. H. BENSON (1444) writes: "My father noticed the following on our lawn yesterday (August 20th 1949). A wasp attacked a Large White (*Pieris brassicae*) butterfly and severed one of its forewings. It continued the onslaught and detached the other forewing. Upon the butterfly being unable to rise, the wasp disappeared under it, emerging shortly afterwards, leaving the wings and remains on the ground. Upon inspection, the body of the butterfly was found to be eaten. I wonder whether this is a usual occurrence."

The EDITOR reports that at the end of July he had set a few newly-emerged and freshly-killed female Drinker moths (*Philudoria potatoria*) just before lunch. The window of his study was open, and after lunch he found a wasp making a meal on the abdomen of one of the Drinkers, with the eviscerated eggs scattered on the board. Similar damage to other moths on the boards was explained and the window kept shut thereafter. He thought, at the time, that it might be due to killing with ethyl acetate, giving the insect a fruity smell, as it had not occurred in previous years, when E.A. was not used as a killing agent; but Mr Benson's note above upsets that theory.



"Sound the gong, Vespie, lunch is ready."

LARVAL COLOURS OF THE PALE TUSSOCK

I have bred the Pale Tussock (*Dasychira pudibunda*) several times from ova during the past five years, and each time the young larvae have been of the beautiful yellow or green forms during the first two instars, afterwards changing to a brown, grey or black form. I have bred these under natural conditions on sallow or hazel. In the wild state I find more of the yellow and green forms than the darker ones. I should like to hear the experience of other members on this point.

ROBERT W. WATSON (752).

OBSERVATIONS ON A PUSS MOTH CATERPILLAR

Sometime in June 1947 I was given a fourth instar Puss Moth (*Cerura vinula*) caterpillar. It was an easily irritated creature. When it, or the tin in which it was kept, was touched, it quickly assumed the typical hunched attitude and, drooping its horns over its back, would protrude the pink "tails" from them. I had bred Puss Moth larvae previously, but they had always developed the annoying habits of chewing each other's horns, so I welcomed the opportunity of studying these remarkable modifications in my single specimen.

The larva seemed very sensitive to vibrations. Having read of acid being sprayed out, I irritated the caterpillar and tested with litmus, but with a negative result.

The horns seem to have been formed from, or in place of, the last pair of prolegs, commonly referred to as claspers. In my specimen they were of a pale green colour, translucent and studded with black warts. The red "tails" could be seen lying in the horns. With the help of a binocular microscope I observed that the tail is protruded out of the horn by an action similar to the eversion of a turned-in glove finger.

B. HOPKINS (827).

EGGS OF DARK SPINACH MOTH

South (2—pp. 254-255) makes no reference to the eggs of the Dark Spinach (*Pelurga comitata*), so the following may perhaps be of interest.

Shape ovoid; slight lateral flattening; roughly 0.7 mm. long. Pale green; surface grooved in a hexagonal pattern and minutely pitted.

The ova were obtained from a specimen that I captured in the garden and placed with a potted-up plant of a Goosefoot (*Chenopodium*). They were deposited singly and in twos on the stems and upper surfaces of the leaves.

Hatching took place in eight or nine days.

O. M. WHITE (140).

TECHNIQUE

Protection Against Mould

There has occasionally been correspondence in the *Bulletin* on the problem of protection of insects from mould in humid tropical climates. Has anyone tried out silica gel, stored with the specimens in airtight metal boxes? It will make the air too dry for moulds to grow. It is clean to use and is already used with commercial goods in the tropics (see *Introduction to Industrial Mycology*, Smith, published by Edward Arnold, page 230).

P. F. BIRD (896).

INTER-SPECIES PAIRING IN LEPIDOPTERA

During August of last year (1949), while collecting moths at rotten apples, sliced and placed on tree-trunks, I saw a Setaceous Hebrew Character female (*Amathes c-nigrum*) paired with a male Square-Spot Rustic (*A. xanthographa*). I was able to capture them, and the female is at present (early September) depositing eggs, a few each night. Is such a cross-pairing in nature unusual?

G. VICTOR DAY (29).

Stoke Ferry, King's Lynn.

PUBLICATIONS RECEIVED

The School Nature Study Journal, No. 177.

Field Book of Beetles, by J. R. Dibb (1195). (A. Brown and Sons.) 21s.

The Coleoptera of Askham Bog, by J. H. Fidler (1256). 1s.

REVIEW

Patterns of Life, by Alan Dale (908). Pp. xii + 338 + VIII photographic plates + 174 text-figures. London: William Heinemann Ltd., 1949; 12/6. A special school edition at 7/6 is also published.

I recommend this book; if I draw attention to some blemishes it is far more in sorrow than in anger. The

"get-up" strongly recalls Helen Mellanby's excellent *Animal Life in Fresh Water* (Methuen, 1938), and the comparison is intended as a compliment.

Mr Alan Dale is an AES member, and we offer him sincere congratulations on this really admirable introduction to British natural history for intelligent younger readers. There is nothing dry or "woolly" or conventional about it; it is full of interesting items of information, based on personal observation. There are four parts: the first (pp. 1-16) is on collecting and naming; the second (pp. 17-198) describes the various groups of plants and animals (but with some omissions, e.g., algae, birds, mammals); the third (pp. 199-304) deals with such interesting biological subjects as territory and migration in bird life, colour in animals, seeds and seedlings, insects and flowers, trees, life in fresh water, plant and animal reproduction, plant-animal interrelations, and plants and animals in winter. Part IV (pp. 305-328) comprises "things to do" and a book list, and there is a good index.

A particularly valuable feature is the inclusion of keys to some of the less-known groups, e.g., wasps (pp. 111-112), bumble-bees (pp. 122-125), woodlice (pp. 194-198). Most of the text-figures are admirably clear, though they vary in quality, e.g., fig. 91 (p. 164) is poor compared with figs. 90 and 92, and fig. 101 (p. 179) is crude by comparison with fig. 100. Fig. 54 (p. 91), showing the action of the earthworm's bristles in its burrow, is really excellent, and so is fig. 65 (p. 117) illustrating the locking mechanism of a bumble-bee's fore and hind-wings. The chart on p. 269 showing food-relationships among pond-organisms likewise deserves special mention.

Mr Dale states in his preface that he has "indicated the most usual pronunciation" of each Latin name. But surely the most "usual" pronunciation of *sanguisuga* (p. 96) is not "sang-we-sew-ja"? and even if it were, how could it be justified? Why should *Herpobdella* and *Helobdella* (l.c.) feature as "her-po-della" and "hee-lo-del-la," and, oh dear, *ratzeburgii* (p. 197) as "ratz-bur-je-ee"?! And I have never heard *Nepa* (p. 163) pronounced "nep-a" to rhyme with "pepper"! Pronunciations (usual or otherwise) could well have been omitted. As a

botanist, I must take exception to the six perianth-segments of the tulip being described as "petals" (p. 17); and it must be quite 100 years since the rootless duckweed (p. 37) was removed from the genus *Lemna* to *Wolffia*! (I should very much like to know Mr Dale's authority for retaining it in *Lemna*; no modern British or Continental flora, to my knowledge, treats it thus.) Most present-day Hymenopterists transfer *Sirex gigas* (Plate VII, fig. 6) to *Urocerus*; and similarly the genus *Vespa* now includes the Hornet only, the true Wasps (pp. 110-111) being removed to *Vespula*. Finally, one or two "howlers" have crept in: *Limnaea* "peregrer" (pronunciation and all!) for *pereger* (p. 79); "on the right" for "on the left" in legend to Plate III, A; *Anopheles* "algeriensis" (with pronunciation!) for *algeriensis* (p. 159); "*Chorthippus*" for *Chorthippus* (pp. 170-171). The legend to Plate IV says "All enlarged," but surely the Violet Ground Beetle is not? The title of our society is the Amateur Entomologists' (not "Entomological") Society (p. 326), and the title of Ford's book (p. 328) is simply *Butterflies*. It is good to see a reference to the Bible in a book on nature, but the phrase in Isaiah, xl., 6, "All flesh is grass" (p. 296), clearly refers, not to the dependence of animal life on plants, but to the transience of human life as compared with the Word of God, as the succeeding verses (7-8) show.*

This book deserves to run to a second edition. If it does, and the author then takes the opportunity to tidy up some of the loose ends indicated above, he will make a good book even better. "Man," he quotes (p. 252), "is an animal that can look up but seldom does." Grimly true. Books such as this (and I would like to add Richmond Wheeler's thoughtful *Harmony of Nature*: Arnold, 1947) may encourage some of our younger "Men" to look up.

H. K. AIRY SHAW (545).

*The reviewer would be glad to hear from any AES members interested in the Bible.

CORRECTION

In *Bulletin 109* (Jan. 1950), on p. 3, top, right-hand column, for *Euphorea* read *Euploea*; and on p. 4, bottom line, read "*Ectopsocus briggsi*."

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AES NOTICE
1950 SUBSCRIPTIONS

In 1949 the Society sent the *Bulletin* for nine months to scores of members who had not paid their subscriptions. To these members, a final notice was sent instead of the October *Bulletin*, with the result that those members who had merely overlooked payment, paid up; but there are still people who have received the *Bulletin* for nine months and not paid.

The Society cannot risk this financial loss—the actual cost of putting one copy of the *Bulletin* in a member's hands has increased a lot—so this year, the final notice will be sent in place of the **APRIL** *Bulletin*.

But would it not be better to avoid this dislocation and all the unnecessary trouble it causes to so many people and

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A G M

The Annual General Meeting of the Society will be held in March. Full details will be sent, with the March *Bulletin*, to all Members.

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SKOKHOLM is an island of 262 acres situated three miles West of St. Anne's Head, Pembrokeshire. Its size and the ecological barrier formed by the sea, make it an ideal habitat for long term studies. The Observatory is already well-known for work on the migration and life history of birds.

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**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

EDITED by TREVOR TROUGHT, M.A., F.R.E.S.

NOTICE TO ADVERTISERS

THIS PAGE IS
TO LET

Appl—
E. LEWIS.

8 Parry Road,
London, S.E.25.

ATTENTION ALL LEPIDOPTERISTS!

HELP WANTED
IN LONDON

Are there ANY AES lepidopterists in the London area who would be willing to contribute something of value to the Home Counties fauna list and at the same time enjoy an inexpensive day out? I am appealing as the Survey Secretary of the Hampstead Scientific Society. We are assembling and eventually publishing check-lists of the fauna of Hampstead Heath in all the Natural Orders. We've got hymenopterists and beetle collectors; a bug hunter (hem-het) is hard at work, and so are several other specialists, but lepidopterists are as rare as Mazarine Blues. We can't promise you anything positively breath-taking, but micros abound and we have a fair number of Emeralds. There are many exciting and unsuspected specimens to be taken by the diligent. We welcome entomologists of all kind but lepidopterists are especially wanted at the moment. Would someone care to take over the organization of this Order for us? The bibliography is reasonably extensive. Write or phone me. The address is 85 Cholmley Gardens, N.W.6. (Telephone Hampstead 4626).

JOHN HILLABY (1492).



AES



No.

111

BULLETIN

MARCH 1950

EDITORIAL

It is our pleasure to record that Professor G. D. Hale Carpenter, M.B.E., D.M., Emeritus Hope Professor of Entomology in the University of Oxford, has accepted the AES Council's invitation to become an Honorary Member of the Society. We welcome Professor Carpenter to our Society and look forward to many years of mutually profitable co-operation.

Professor Carpenter comes of a family of distinguished men of science and early became interested in the part played by insects in tropical disease. He joined the Colonial Medical Service in 1910, and studied the bionomics of the tse-tse fly (*Glossina palpalis*) on the Sese Isles of Lake Victoria, in Uganda. In the East African Campaign of the 1914-18 war, he served as a Medical Officer and made large collections while stationed in various parts of Uganda, German and Portuguese East Africa. He was awarded the M.B.E. in 1919. After that war, he was appointed specialist officer for Sleeping Sickness Control until his retirement in 1929. In 1933 he was appointed to the Hope Professorship at Oxford, in succession to Professor Sir E. B. Poulton, from which post he retired in 1947. He was elected President of the S.E. Union of Scientific Societies in 1936 and of the Royal Entomological Society in 1945-46. He has greatly increased our knowledge of the butterflies of East Africa, and written largely on various aspects of insect colouration and habits. He is now researching on anomalies in distribution among the *Euploea* of the Solomon Islands. He is the author of *A Naturalist on Lake Victoria*, *A Naturalist in East Africa*, and, with Dr E. B. Ford, *Mimicry*.

MUTILLA SP.

In answer to the query in P. W. E. Currie's note on p. 1 of *Bulletin* 109, the stridulation of the *Mutillidae* is produced by friction between the adjacent segments of the abdomen. The posterior edge of one segment grates against a roughened area on the dorsal surface of the next one,

and the general effect is that of the creaking of a badly-oiled suit of armour.

The British species, *Mutilla europaea*, is also capable of making this sound, which I have myself heard in specimens from Wood Walton (Hunts) and Bovey Tracey (Devon).

The stridulation of *Mutilla* is mentioned in Imms' *General Text-book*, on p. 92 in the first edition [p. 101 of ed. 5].

HENRY G. MORGAN (90).

A NOTE ON THE WATER BOAT-MAN

By R. C. L. HOWITT

On September 3rd 1949, at about 9.30 a.m., while standing by my car at Farndon, Newark, Notts., I noticed several insects of a type unknown to me 'fall' on the bonnet. They seemed to descend vertically as if released by some unseen hand. They fell in twos or threes at a time and made off as soon as I tried to capture them. In all about a dozen fell on the bonnet and several more were seen on the ground around. I captured three, but only one was undamaged. The weather was close, with a very light south wind. The insect was identified by Mr H. K. Airy Shaw (545) as *Notonecta glauca* L. Mr Shaw says "It is interesting to hear of these water-boatmen on the wing in numbers. I myself have never had the good fortune to see one in flight. No doubt they do most of their flying at night."

(The water-boatmen probably mistook the shining car-bonnet for the surface of a pond. For the same reason water-beetles (*Dytiscus*, etc.) have been recorded dropping on to greenhouse roofs on moonlit nights.—H. K. A. S.)

CORRESPONDENCE

The Editor, AES *Bulletin*.

Dear Sir,—If you can put a paragraph in the *Bulletin* to say that I shall be most grateful to hear from any members who can give me any advice on breeding Crickets, Grass-

hoppers, and Dragon-flies, in captivity, I shall be much obliged.

Have been breeding Butterflies and Moths for years, so think I will have a change to something quite fresh and unknown.—Yours faithfully,

H. B. SARGENT (1189).

Rose Cottage, Breage,
Helston, Cornwall.

(AES Leaflet No. 12 on "Collecting Dragonflies" is recommended. The Society awaits an author for a leaflet on Orthoptera.—Ed.)

SPRINGING—CAN IT BE PREVENTED?

The "spring" or "droop" at long periods after setting has always been a problem. When I first started collecting with my brother, many years ago, we commenced with the use of the cyanide bottle, keeping insects in it for a long time until the *rigor mortis* departed. Such colours as green and black were invariably injuriously affected—the black in the course of a short time turning to a dingy dark brown and the green to a dirty fawn colour. We then tried the method of stupefying the insect first, either by the cyanide or, much preferably, by chloroform (which is very quick in action) and then injecting oxalic acid. We found that with this method it was possible to get a proportion of such things as the green Emeralds to retain their fresh colouring. The only one that defied all our efforts was the Blotched Emerald (*Comibaena pustulata*). With the butterflies it was entirely successful. If these are killed by cyanide or ammonia or laurel, there is a tendency for the apices of the forewings to curl up and practically all the insects I get killed by these methods exhibit this tendency after a time. Relaxing by laurel also produces the same defect. By using the oxalic injection method this does not ever occur.

I have tried every known method of killing, including the use of ether acetone (ethyl acetate), which I have found often fails to kill the larger butterflies, even after several hours in the fumes.

The injection method is satisfactory in every way—leaves the insect in perfect setting condition and dries very quickly on the board after setting, and there is no *rigor mortis* to deal with. The preliminary stupefying and injecting the oxalic sounds very complicated but is really

quite simple and quick. It is very easy to demonstrate but more difficult to explain otherwise than orally but to any enquirer I would be pleased to endeavour to explain my procedure. Anyone who cares to experiment should try the cyanide and injection methods on, say, such a species as the Ringlet (*A. hyperantus*) or a species with similar blackish dark ground colour, and note the difference between the two when removing them from the setting board and for a very long period after.

S. G. CASTLE RUSSELL (119).

FIELD COLLECTING TIP

Butterflies, when collected in the field often have the trick of folding their wings "inside out" immediately fluttering ceases in the killing bottle. It is usual to leave insects in the bottle until quite dead before transferring to collecting box, and during this time if we are actively engaged, good specimens behaving in this way will frequently become rubbed through being loose in the bottle; the legs, being wedged between the wings, cannot cling to the cotton wool and provide anchorage. To prevent this risk I find it a good plan to reverse the wings on the spot, and for this purpose I carry an ordinary pair of pointed forceps. When the insect is stupefied take it from the bottle and, holding it "on its back" between the crease of the left palm, insert the forceps between the wings. If the wings are closed tight, release pressure on the forceps which will divide the wings. Open wings further by blowing into them, simultaneously grasping the legs. Whilst thus held by the forceps, and providing the insect is not dead, the muscles will, after a certain point, carry the wings over to the normal resting position. It can then be put back in the killing bottle, and finally into the collecting box between wadding, or pinned, depending on the method we use. These remarks apply equally to most Geometrid moths which are apt to behave similarly in the killing bottle. Many a Carpet has been saved by reversing!

C. R. HAXBY (1508).

THE DEATH'S-HEAD MOTH

The interesting and helpful notes of Mr R. W. Watson (752) in the December *Bulletin* (No. 108) will put many of us into reminiscent mood and I hope the Editor will receive

enough "adventures with *atropos*" to enliven the pages of several future numbers.

The pupa of *atropos* is undoubtedly very delicate, and I recall many failures. In my young days an old friend of mine had a number of pupae given to him by a relative, and one was presented to me. They all died, excepting one which produced a cripple.

My last encounter with *atropos*, some 15 years ago, ended more happily. The late Harry Cox, at that time guardian and bird-watcher for Brean Down, in Somerset, received a larva from a potato digger, and brought it to my house in a small cardboard box. On removing the lid, we found, to our surprise, not the larva, but a newly-formed pupa, of a lovely pale green colour, looking as if the slightest touch would ruin it. However, I very gently laid the open box in a larger receptacle (a rough general-purposes box with a muslin lid and a layer of sifted earth and fibre on the bottom) and left well alone. This, I think, was in August. In October a perfect moth emerged.

ARTHUR BRADLEY (219).

BREEDING THE VESTAL MOTH IN 1949

In 1947, "the great Vestal year," I only obtained one *Rhodometra sacchararia* in my garden here (Ross-on-Wye). Last year (1949) I was more fortunate, taking or observing 7 between 13th and 31st August and 6 between 14th and 28th September. A male and female came to indoor light and the rest were found feeding on *Buddleja* bloom. All were the yellow red-striped form.

From two females taken 27th and 28th August, 7 and 15 ova respectively were obtained.

Most of these were laid on the Michaelmas Daisy provided to feed the moth and a few only were deposited on dock leaves. The first batch began hatching 5th September and were kept at a temperature of about 60° F. The second batch hatched 6 days later and were kept on the kitchen mantelshelf at a temperature of 80°-90° F. By 22nd September these were further advanced than the first batch and the latter were brought into the higher temperature. Pupation commenced 26th September.

The imagines emerged from 2nd-6th September. First batch 5 m. and 2 f. Second batch 7 m. and 5 f.

The males all had pale yellow forewings with red or brown stripes of varying width, and white hindwings. The females were similar but all brown-striped.

Now comes what I think is an interesting point. Three nearly full-grown larvae of the second batch were sent by post to Mr F. R. Sutton, who kept them at a lower temperature (about 60° F.). One died and a male and female emerged; both were quite different from any I had so far seen—the male was pale biscuit coloured with light brown stripe, the female was coffee-coloured with grey suffused stripe. This suggested to me that temperature affected the colour and on these lines I experimented.

Individual pairs apparently would not mate, so, in desperation, I put 3 or 4 of each sex in a large cage and was rewarded with a considerable number of fertile ova, though I never saw a pair *in cop*. Continuing to use the kitchen mantelshelf as a forcing house, I had from these ova, laid 2nd-6th October 1949, 85 larvae by the 9th in spite of the fact that the colder weather had reduced the temperature to 75°-85° F. When half-grown I removed half the brood to a colder "climate," 55°-65° F. Results were as follows:—

Part 1.—75°-85° F. Pupating 17th October. Emerging 21st-31st October 1949. 15 males—pale yellow, bright red stripe. 19 females—pale biscuit, brown stripe.

Part 2.—55°-65° F. Pupating 24th October. Emerging 12th-27th November 1949. 13 males and 7 females, not one of which was similar to those of Part 1. Variation in both sexes ran from blackish brown through bright brown, pinkish brown to pink. Stripes black or sooty. Hindwings white or grey. No two specimens were alike.

From this it would seem that the darker forms are the result of lower temperatures as the separation into two parts was done quite at random. I have a third generation which I am treating in the same way and results may substantiate this suggestion.

I have found the larvae very easy to rear, feeding them entirely on dock. They have a curious habit that I have not noticed in any other species: when a pellet of frass is passed it remains attached to the anal flap, the larva bends round, grasps it with its legs, and,

straightening with a jerk, flings the pellet away with such force as to make it adhere to the glass or side of the breeding cage. At the higher temperature they are very active, waving and twitching in a most peculiar manner. They pupate in any odd corner but not on the food-plant.

I was very interested in Mr V. C. P. Almy's (1387) account of his experiences with this species and hope he is able to record the results of his breeding.

JOHN E. KNIGHT (94).

J. H. PLATTS (515) adds the following note:—"I would like to record the capture at an indoor light of a male specimen of *R. sacra* on September 19th, 1949. The specimen is a very deep pink (? ab. *sanguinaria*). I have never seen one as pink as this one. It was taken at my home in Brockenhurst, in the New Forest. I have heard of records of this insect in the Isle of Wight in 1949, when it was not nearly so common as in 1947, when it was taken all over southern England, and one even appeared a few miles from the Scottish border."

BREEDING SITES OF BUTTERFLIES

I found Mr Ray's article in *Bulletin No. 109*, page 6, on "Breeding Sites of Butterflies," interesting.

Six years ago my attention was attracted to a conspicuous black patch of *Nymphalis io* larvae, on less than a square yard of stinging nettles, on the edge of a large clump which otherwise was entirely free from the larvae; and I could find no more feeding in the vicinity. This occurred again in the following year.

Last Summer (1949) I re-visited the spot, and found an exact repetition of what I had seen in 1943/4.

One can understand some insects making the same tree their breeding domicile from generation to generation, but in the case of *N. io*, where the larvae dispose themselves over a widening area of foodplant as feeding progresses, eventually becoming solitary before pupation, often at a distance from the food-plant, the egg-laying, on the newly-grown nettles, being delayed until after hibernation of the imago, it is not easy to fathom the reason why the identical position in a large clump should be chosen over a number of successive years.

It is not always so, of course.

HARRY E. WEBB (736).

FINDING AND BREEDING THE PURPLE EMPEROR

A few words on the finding and breeding of *Apatura iris* may not come amiss to those who are within reach of its possible haunts, which are probably rather more extensive than is generally realised by some Amateur Entomologists.

It is, of course, possible to take this insect in reasonably good condition, both by the use of a specially lengthened handle to the net, and also at lower altitudes, when the males are attracted down by some "bait," natural or otherwise, and when the females are visiting the more accessible willow branches to lay eggs, but in many cases these specimens will be the worse for wear and with such an insect the practice of capturing a female which is not in good cabinet condition is to be deprecated. Better that it should be left to lay the remainder of its eggs to continue the species.

It may be mentioned that efforts to obtain ova from a living female *iris* in captivity are practically always unsuccessful.

But to those lucky enough to find a "locality" I strongly recommend searching for the eggs. This not only provides perfect specimens, but leaves a good proportion of the ova (laid on the higher branches) to produce future generations of the butterfly.

The best time for an ova hunt is, on an average, about the last fortnight in July, and with a little practice and much patient examination of the upper sides of the willow leaves (principally the broad-leaved variety) sufficient eggs may sometimes be obtained to make a welcome addition to the collection in the following year.

My own method of breeding this insect is to cut out the portion of the leaf on which the egg is laid and stitch this with a needle and cotton directly on to a growing leaf of a willow tree in the garden, subsequently sleeving the branch, where there are sufficient leaves to support the young larvae until they go into hibernation.

They should be examined once or twice in the autumn and it is important to see that the leaves are free from 'blight,' which will multiply in the shelter of the sleeve and damage the leaves and young larvae.

The larvae are then left until about the middle of March (the

sleeve being secured and protected as much as possible from the effects of wind, etc.), when another examination is made; afterwards it is only necessary to see that they have a sufficient supply of food, and to watch for the formation of chrysalids, which, in captivity, frequently occurs considerably earlier than normally. These are then transferred to a breeding cage indoors, pinned on to the side by a portion of the leaf to which they are attached, and left to emerge.

It is found that those larvae which reach the stage of commencing to feed after hibernation are practically certain to get through; the relatively few losses occur in the earlier stages, usually before hibernation.

Not everyone, of course, has the advantage of a growing willow tree, but excellent results in rearing *A. iris* can be obtained by starting them on willow twigs placed in a small bottle of water, and covered with a glass cylinder having a perforated-zinc top, the whole standing on some damp sand in a dish. For the hibernating period, however, this must be kept in an open shed, or placed in a "cage," with plenty of ventilation, fixed in a sheltered spot on a wall out of doors; when the larvae are about to settle down for hibernation the cut stems of the foodplant can be put into the damp sand direct and covered by the cylinder. I personally have not tried this method, but know of two collectors who have found something on the same lines quite as successful as sleeving.

It may be added that it seems fatal to try and start young *iris* larvae by the "air-tight tin" method.

G. C. HOLROYD (253).

FLIES AT SALLOW BLOOM

The AES field meeting, Barkstone Wood, Leicestershire, on April 3rd, 1949, took place in mild weather. The site was mixed coppiced woodland with small isolated willows (*Salix caprea* L.), at the bloom of which a number of mostly dipterous and hymenopterous insects were feeding. During the afternoon, in windy conditions which hindered observation, samples of the *Diptera* were collected at the willows excepting those bushes which were made inaccessible by very wet ground, and the following count obtained:—

Diptera.	Nos. of Species.	Nos. of Individuals.
Hover flies (<i>Syrphidae</i>)	2	5
Yellow dung-flies (<i>Cordiluridae</i>)	1	10
'Tachinid' flies (<i>Larvaevoridae</i>)	1	1
Allied house-flies (<i>Muscidae</i>)	5	16
Totals	9	32

With Mr Dunkin's help a search of nearby uncut woodland was made for *Lepidoptera*, but only common species were found. These were mainly on oak trunks: *Diurnea fagella* Schiff. (*Oecophoridae*), and a recently emerged, slightly deformed example of *Orthosia cruda* Schiff. (*pulverulenta* Esp.) (*Caradrinidae*). In open spaces *Tortricodes tortricella* Huebn. (*Tortricidae*) was freely in flight.

The Tachinid fly referred to is the common *Phormia* (*Protocalliphora*) *azurea* Fall.; this specimen was kindly determined for me by Mr H. Audcent. The *Cordiluridae* seem to be one species (five males, five females) and they agree with the characters of the common yellow dung-fly *Scopeuma* (*Scatophaga*) *stercorarium* L. O. M. WHITE (140).

BEE-KEEPING

Spring Manipulations

(Continued from Bulletin No. 110, page 18)

Spring feeding can be carried on when the bees are flying well, towards the end of March, according to the season, with weak syrup; although this is said to stimulate a colony to breed, I think the main asset is the provision of water in the syrup, which avoids loss of flying bees in unsuitable weather at this time.

After a good flying day in March it is a good idea to Frow the colonies as a precaution against Acarine disease. I always do this in the autumn about a fortnight after I have finished feeding, thus allowing the bees to seal their stores unhampered. To make sure I give a spring dose as well—it is better to be safe than sorry. as Acarine is the cause of many a weak colony in spring.

Provide a flight board to reach the ground. This helps many bees laden with pollen to return to the hive, who would otherwise become chilled. There is an argument that says this will enable diseased bees to return to the

hive as well, but remember, if you have managed your bees properly you will have no disease and in any case a sick bee will always walk away from the hive to die. If placed on the alighting board it will walk away again and will not enter—I have watched this happen time without number.

Don't examine the brood nest at all until well into May according to season. (Unless, of course, you suspect something wrong. If you do and you are only new to the craft, get an expert's advice before doing anything. Your local Association or County Bee Expert will help you.) It is often a temptation to have a look inside, but the flight board will tell you all you want to know. If you place your hand under the packing in the top of the hive at the end of March and it feels warm, the queen is present and breeding. If the bees are carrying in big loads of pollen usually all is well. If, however, drones are seen early in the spring beware of a drone-breeding queen—some colonies keep a few drones through the winter, but if a lot are seen, it is as well to confirm the presence of an offending queen, and unite to another colony by the newspaper method, after killing her.

Queenless colonies should be united also—these are usually listless and very little pollen is carried in.

A weak colony can be helped in early April by placing division boards in such a position that the bees have just two empty frames to use other than those they cover well. Move them outwards as the colony expands. This enables the bees to conserve heat.

In April, according to season and district, the colony should be supered if it covers 8-9 frames—not less. This can be done on a suitable day, without disturbing the brood nest. Just peel off the quilt, place the queen excluder in position, the super on top and close up.

Given good weather, on which all beekeepers are dependent, you should now be in a position to take advantage of any surplus honey crop available. But remember there is next year to think about and now is the time to plan for it. You require by the autumn a good young queen, preferably bred by yourself, in a strong disease-free colony with ample food and you yourself want some surplus jars of honey in your store cupboard. Good Luck.

D. M. JESPER (1152).

A JOB TO DO NOW

If it has not already been done during the slack period of the last month or two, attention should be paid now to the accommodation for this season's larvae.

The majority of cages I see are sadly neglected and in many cases simply breeding grounds for the ailments to which larvae are heirs.

All wooden cages should, at least once annually, be thoroughly scrubbed out with hot soapy water, to which one of the phenol disinfectants has been added. The hot water should be well forced into all crannies and crevices. This will, if thoroughly done, completely free the cages of those lingering disease germs so fatal to growing larvae.

While doing this, keep an eye open for any small white grubs which may wriggle out of corners. These are the larvae of sundry micro-lepidoptera and are highly destructive to any pupae which may later be put into the cage. If not damaged, breed them out for identification.

Boil and dry all sphagnum moss, peat or fibre used as pupation material. Then store in a reasonably air-tight container to prevent re-infestation.

Thoroughly wash out all metal, celluloid and perspex cages and if necessary repaint. Clean all glass fronts and replace loosely to avoid damage.

Glass-topped tins and metal boxes used as containers for eggs and small larvae should be put into a vessel of cold water and brought to the boil; carefully dry those liable to rust.

If these very simple instructions are followed I feel quite sure the season's breeding will be a lot more profitable and the mortality amongst your larvae much reduced.

This small article will probably be classed as elementary. It is; but how many entomologists observe the elementary rules, so necessary to the health of the creatures they confine (entirely for their own profit and pleasure) in unnatural surroundings?

H. E. HAMMOND (423).

HAMPSHIRE COUNTRYSIDE

My recollections of country life in 1949 are extremely happy. Again those wild violets on green spring banks; fresh, clean bracken bordering the rides of the oak-woods, where *villica* abounds and where the woodpeckers laugh and tap unceasingly.

A vast carpet of bluebells, where the yellow broom forms a background on the high bank, and the deeper

yellow marsh marigolds sleep low down in the moist withybed. The cool, early summer fog poised silently over the marshes, something like a white sea. The heavy scent of vegetation wafted up from the sweet, cool earth after a summer evening shower, with a promise of many moths at dusk!

The grass on the downs sighing softly in the summer breeze, where *bellargus* and *coridon* roam the green banks in their tireless, sporting manner. Farm buildings rising dim in each gathering dusk; the rare aroma of bonfires. Away to the east, beyond the pasture land, the woods making a black barrier against the darkening sky, where owls hoot and yell all the time I am collecting at my ivy bloom.

Colourful autumn! Young hazel-catkins already appearing on the wind-blown bush, forerunners of yet another spring!

Turning to my log-book I find the following extracts indicate something of the interest and joy I found in my wanderings in the country during 1949:—

Jan. 8—Clear, moonlight night with biting north wind. Heard the sudden "chipping" of a blackbird after 10 p.m. Many male *defoliaria* at light recently.

Jan. 11—Wood Pigeons, Great Tits, and Green Woodpeckers in large numbers in the woods.

Jan. 15—Furze in bloom; honeysuckle foliage prominent. Song Thrush and Robins singing. Listened to the astonishing variety of notes of the abundant Great Tit. The song of the Robin sounds less mournful. Is it imagination, or does the song change at the approach of spring?

Jan. 16—Observed the first meadow buttercup (*Ranunculus acris*, L.) in a field near home.

Jan. 18—took the first male *leucophaea* at light.

Jan. 20—Two celandines were brought to me to confirm the report of their first blossoming on Jan. 10.

Jan. 23—In the ride of the oak-woods I was walking through, a Cole Tit almost alighted on my field-glasses. Took several *leucophaea*.

Feb. 5—Many primroses in bloom.

Feb. 19—Most prominent bird-songs in the woods were Yellow-hammer and Chaffinch.

Feb. 25—The first *cruda* (Small Quaker) at light; and *stabilis* (Common Quaker) on 28th.

Mar. 8—Observed numbers of Black-headed Gulls with the dark heads of summer plumage.

Mar. 13—The first *miniosa* (Blossom Underwing) emerged from a colony of larvae taken in the New Forest on May 15, 1948.

Mar. 21—The first butterfly of the year: *rapae*. (What's happened to *rhamni*?)

Mar. 22—A great chorus of Song Thrushes at dusk.

Mar. 24—At light: *badiata* and *strataria*; and on 25th, *bilunaria*, *stabilis* and *aescularia*.

Mar. 26—*Rhamni* appeared at last: several males, also *urticae*, *io* and *c-album*. First Bluebell and Red Champion. The first nest of the season, a Blackbird's with three eggs. A Blackbird sang from the top of a pear tree in the garden all day.

First appearances of migrant birds:—

April 11, Willow Warbler; 12th, Chiffchaff; 13th, Nightingale; 14th, Cuckoo; 15th, Whitethroat; 16th, Lesser Whitethroat and House Martin; 17th, Blackcap and Sand Martin; 18th, Wood Warbler (Sedge Warblers abundant along the river-side the same day); 21st, Swallow; and 30th, Swift.

April 15—Warm and cloudless Good Friday. Butterflies included *aegeria* (first appearance), *rhamni*, *io* and Whites. Much bird song in the Warren, especially Nightingales and Willow Warblers. Watched a Greater Spotted Woodpecker at work high up in a willow bordering the stream. Two Blackbirds' nests with eggs.

April 17—Visited the small pond beyond Park Hills to find a Moorhen's nest almost completed. This is the third consecutive year I have found a Moorhen's nest in this pond, in almost the same spot each time.

April 18—Larvae of *dominula* feeding on Comfrey by the river. The first Damsel-fly settled on my hand!

April 20—After slight modifications to a two-year-old nest in a small brick building, a Wren was discovered to have laid three eggs in it. Two eggs were found in this nest on May 10, 1947; the Wren at that period had slightly modified the old nest of a Robin.

May 3—In the warm wind, the aroma of a broad-bean field in bloom. I strongly suspect a Goldfinch's nest in one of the pear trees as a result of a recently-observed pairing.

May 4—Found the Goldfinch's nest at the top of a pear tree, containing five eggs.

May 10—Crossing a field of sheep I was greeted in a most affectionate manner by two small lambs.

May 28—Four Robin's eggs were found in the nest of a Great Tit in a hole in an apple tree, in which the Great Tit had laid ten eggs by May 2nd. The nest being deserted by the Great Tit, the Robin has taken possession without any repairs to the nest whatever.

June 5—The dawn chorus. First bird song, Skylark, at 3.34 B.S.T. Twenty-two species of birds recorded from the garden. By 4 a.m. the chorus of Blackbirds and Thrushes was so great it made the identification of other birds difficult.

June 11—Pupation of *quercus* (Oak Eggar), *potatoria* and *caja*.

June 16—Commenced search for Burnet cocoons on the downs; collected nine. The following quantities were collected in the hope of obtaining varieties, the imagines ultimately being released:—18th—3; 21st—39; 24th—69; 26th—64; July 2—108; 6th—178.

June 21—Found a pair of *trifolii*, in cop. within a few inches of an empty pupa-case. It seemed apparent that the female had emerged and was selected by a male before flight.

July 14—Observed a clump of Ragwort by the roadside on which the first *jacobaeae* larvae were feeding.

July 24—*Croceus* common; saw one *helice*.

Aug. 5—A great abundance of *coridon* and several *croceus* on the chalk downs.

Aug. 12—Lavender bloom attracting a host of butterflies.

Aug. 15—On a hill near Winchester *bellargus* is emerging: saw nine males. In the same locality on the 19th saw 23 males and one female (in cop.). On the 21st males were abundant but only two females. Many fresh females appeared on the 27th. *Bellargus* was observed in company with *coridon*, *agestis* and *icarus*.

Sept. 16—Ivy bloom coming well out and attracting a host of diurnal insects.

Sept. 19—*V. atalanta* becoming abundant in the garden; several *c-album* with them.

Sept. 20—Although windy, many moths at ivy bloom, nine species altogether; also a large gathering of earwigs, lace-wing flies, and plume-moths.

Sept. 25—An adjacent lucerne field revealed a fresh brood of *croceus*: took three *helice*. This splendid locality produced more *helice* as follows:—29th—2; 30th—2. Quite a few *cardui* also appeared on lucerne.

Sept. 30—Watched *sauucia* (Pearly Underwing) ovipositing on a window pane after dark. This was the real night at the rich ivy bloom, the night of many species, the night of much hooting of owls, the night in which, in my extreme enthusiasm, I fell off the shed-roof with my best suit on!

Three months to go. Three months of joyful anticipation. The ivy will still bloom and *helice* will still appear in the lucerne field. And before the dark days of winter I shall observe much of interest in the ever-changing panorama of the countryside.

The Figure-of-Eight moths will fly around the street lamps again, and I shall experience the same old thrill at the first sight of *defoliaria*. A rare, welcome intruder like *N. antiopa* may yet appear. Who knows?

(To be continued.)

PAUL H. HOLLOWAY (429).

REVIEW

The Coleoptera of Askham Bog. By J. H. Fidler, M.A., Ph.D. (1256). Reprinted from "The Naturalist," July 1949. The Yorkshire Naturalists' Trust, Ltd., York. Price 1/-.

Askham Bog has long been famous to coleopterists for its water beetles and Dr Fidler has performed a useful service in collecting the many scattered records. To these he has further added a large number of hitherto unpublished records, his own as well as those of other recent collectors. It is inevitable that in a work of this nature the local specialities are recorded over and over again, while the commoner and more general species the visiting collector seldom troubles to note, but without which no local list is adequate. It is in an effort to remedy this deficiency that much of the more recent collecting has been done, yet on the other hand five of the local specialities have not been taken (or at least recorded) since first discovered some 50 or 100 years ago, and every effort should be made to rediscover them.

The Bog is now a Nature Reserve, so that the moment for the appearance of the List is opportune as it will form a useful basis for the observation of any changes that may occur. The map that accompanies the paper is rather unfortunately limited to the Reserve and does not show the adjacent Chaloner's Whin (possibly an error for Chandler's Whin, as it usually appears) whence so many of the Askham Bog specialities are obtained.

K. G. B.

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AES NOTICE
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In 1949 the Society sent the *Bulletin* for nine months to scores of members who had not paid their subscriptions. To these members, a final notice was sent instead of the October *Bulletin*, with the result that those members who had merely overlooked payment, paid up; but there are still people who have received the *Bulletin* for nine months and not paid.

The Society cannot risk this financial loss—the actual cost of putting one copy of the *Bulletin* in a member's hands has increased a lot—so this year, the final notice will be sent in place of the *APRIL Bulletin*.

But would it not be better to avoid this dislocation and all the unnecessary trouble it causes to so many people and

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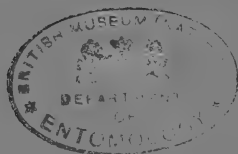
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No. 112

1950



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OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY

EDITED by TREVOR TROUGHT, M.A., F.R.E.S.



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AES



No. 112

BULLETIN

APRIL 1950

EDITORIAL

An AES member offers accommodation in his own house to other members for holidays: South Hampshire.

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HINTS FOR JUNIORS

On System

A more scientific interest in any branch of collecting should grow with the Collector (and with his or her collection!), but young 'bug-hunters' will benefit by cultivating a systematic approach to their hobby from the early days.

Even a small collection may be planned with advantage. In the case of the more common insects a decision as to the approximate number of specimens of each sex and kind to be shown must depend to a large degree on the storage space available; and it is as well, for a start, to aim at a regular and not too long a series of each insect and to regard quality (including condition, setting and arranging) as of more importance than quantity.

Rather than collect butterflies more or less haphazardly, it is better to select a few species each season, choosing kinds which emerge at different times, and trying to complete the required series* of each. This, of course, does not mean entirely neglecting anything else of interest that may be met with, but merely making the chosen species the main objective for the season. Such a plan gives an improved knowledge of times of appearance, localities, etc., and, in this connection, it is better to assume that an insect may be about on the early side (unless it is a definitely cold and late season), rather than find when in the field that it is nearly over, and in poor condition.

When the nucleus of a butterfly collection has been formed, it is helpful to make a list at the beginning of the year of the numbers of more common species required. This enables the collector to regulate his captures accordingly.

Have some standard (whatever it may be) regarding the condition of specimens for the collection, and keep an *Entomological Diary*, noting among other things any rarity or unusual form seen.

The importance of attaching full data labels to all specimens has been the subject of recent articles in the *Bulletin*.

When setting an insect, it is helpful to pin a small slip of paper beside it, bearing the date on which it was set, as well as date of capture. This ensures that specimens are not removed from the boards before they are ready.

Always carry a pill-box in the collecting season, as an interesting moth may turn up unexpectedly, at rest on a fence or tree-trunk (or even lying on the pavement!), and after a little practice the habit of keeping an eye open for such finds becomes almost automatic.

G. C. HOLROYD (253).

**Would members let the Editor know what they think to be the requirement for a minimum series?—Ed.*

Labelling

It is convenient to prepare labels in advance of removing specimens from boards.

A brief list in the front of an old diary is made, so:—

Light.	Oxford.	3.6.49.	10.
Sugar.	Reading.	4.6.49.	8.

The figures 10 and 8 are the numbers of labels required. When there is time to spare, the labels can be prepared and left in a strip, stuck by a corner on the appropriate date page of the old diary, where they can be quickly found and snipped off as required when unsetting.

Pins

A great deal of time and trouble can be saved in the picking up and arranging of lills in forceps for setting, by sticking them into an odd piece of cork or balsa wood as they are removed, in taking specimens off the boards.

This 'pin cushion' can remain indefinitely for future use, from which they can be readily picked with forceps without handling.

C. RENFREW (1057).

THE STEM FEEDERS. No. 3

The Frosted Orange (*O. ochracea*)

Anyone wishing to study the stem feeders could do no better than commence with this handsome species. It is obtainable throughout almost all the British Isles and is very interesting to rear. The usual facts about the life history are given in the text books but this article may assist in collecting and rearing the larvae.

A strange fact about this species is that it can be well established in a locality without ever being taken unless definite attempts are made to discover the larvae. In this district an old collector discovered a locality for it and took half a dozen pupae in 1868. Exactly 30 years later another collector went to the same spot and took some more—and that record was the last we had for the district—12 larvae, July 1898. On looking through the old records, which are always a source of much pleasure and edification, it struck me that it would be interesting to see whether the species was still to be had from this same locality in 1948, just 50 years later. One of our former members had lived and collected in this same locality for almost the whole of the 50 years and had never seen the moth in any of its stages, but on the second search we made, the exact spot indicated in the old record was found to produce the larvae—just 80 years after the first record! It should be said that this area consists of two fairly large fields and despite intensive searching I have not found a single specimen outside them.

The choice of food-plants is interesting. As the area was so small I was able to examine every likely plant, and the result was as follows:—

Marsh Thistle—1 larva in every third stem.

Creeping Thistle—1 larva in every fifteenth stem, but only the really large plants were worth examining.

Spear Thistle—No larvae whatever discovered despite abundance of this plant.

Ragwort—1 larva in every sixth stem.

It will be seen that easily the best plant for this area is the Marsh Thistle. Southern friends tell me that a favourite plant in the southern part of the country is the Burdock.

Unlike the two species previously described, *ochracea* does not leave the stem and attain full growth in the root; for even when fully grown it may be found either in or at the base of the main stem. When ready for pupation it chooses a spot some three or four inches above the root and there it eats a hole in the stem large enough to allow the moth to find a way to the outer world. The larva then pupates, head uppermost, in the stem. The best time to obtain this species is about July 31st, for then both pupae and fully-grown larvae may be obtained. Extreme care must be taken in collecting, as the stem of the plant has a bad habit of snapping just at the point where the larva or pupa is located. The best plan is to cut the thistle low down—say two inches below the surface of the ground and to split the stem carefully upwards. If it is found to be empty it can be discarded but if the desired specimen is within the whole stem should be taken home. Pupae should be carefully taken out of the stem and kept between dock leaves until they hatch. The reason for this is that the thistle stem goes so hard and dry that the moth will not be able to escape when it emerges. Larvae should be left inside the stem until they pupate and then dealt with as described above.

Obtaining pairings in captivity is very difficult and hardly worth trying out. It is much better to obtain a few wild larvae occasionally. It might be mentioned in closing that the moth is very "greasy" and one of the prescribed methods should be used in dealing with it.

W. E. COLLINSON (247).

[Mr W. E. Collinson's notes on the Stem Feeders in this and previous *Bulletins* (Nos. 107, p. 82, and 109, p. 1) will, it is to be hoped, attract similar serial notes from other members who specialise in particular groups of any Order of insect. (Mr Collinson's name was, regrettably, omitted at the end of his article in *Bulletin* 109.) Reference the above note on the Frosted Orange, this moth will come to light during the latter part of September and early October in Tysoe.—Ed.]

A QUICK-DRYING METHOD FOR LEPIDOPTERA

The article by E. Weightman in *Bulletin No. 108*, p. 95, on "Springing" prompts me to suggest the following method which I have always found satisfactory.

When I have a sufficient number of specimens on my boards I place them for a few hours in a moderately hot oven. The wings must be *completely* covered with tracing paper and pinned closely all round to prevent curling. Springing has never occurred with any of my specimens dried in this manner.

I have found it an excellent preventive of grease. In my opinion, all species which tend to become greasy should be set accordingly—for example, *cossus*, *ornitopus* and *humuli*.

It also enables one to keep the setting boards clear at the busiest times of the season. As an example of the speed at which the system operates, on November 28, 1949, I took a male *Poecilocampa populi* at rest on a wall at approximately 9.40 a.m., and at 4 p.m. it was in the collection!

There seems to be no limit to the heat to which the specimens may be subjected, providing the wings are well covered; and in my experience the antennae, abdomen and legs have suffered no distortion.

PAUL H. HOLLOWAY (429).

(Note.—Mr Holloway, in a letter, suggests that beginners should start experimentally, using common moths only. He himself, however, would not hesitate to use his method for *atropos*, *convolvuli*, etc. His setting boards have never warped yet. He generally puts his boards in the oven last thing at night, when the fire is dying down, and takes them out in the morning, thus avoiding priority domestic peaks. He could give no estimate of temperature for the benefit of electric oven users.—Ed.)

THE LABELLING OF SPECIMENS

My remarks in the August *Bulletin* (No. 104, p. 60), regarding the labelling of specimens, have evoked some valuable contributions from two eminent entomologists and amateurs will do well to heed their advice if they wish their captures to have any scientific value.

I should have made it clear that the numbering system should *never* be used for insects collected overseas

or for any insects that are likely to have a scientific value themselves.

The large majority of insects of the better-known Orders collected in this country have no value as specimens but the collection of them is an essential adjunct to their study. The collection should be a means to an end and not an end in itself.

Professor Hale Carpenter says "... a collector may not want anyone but himself to see—and understand—his collection; of him we have had enough!" I know of at least two well-known entomologists who are engaged in writing important contributions to British entomology but nobody else would understand their collections and their specimens would be of little use to any museum.

In conclusion, I would advise all amateurs to put full data on the pin when the collection as a collection is the main objective, but careful use of the numbering system can save valuable time if the worker is specialising and intends that *his* contribution to entomological knowledge shall be a written one.

L. S. WHICHER (1345).

Surely there is a workable compromise between the viewpoints brought forward by the professional and amateur entomologists on the labelling of specimens.

I sympathize with the members who, through shortage of time, find the use of numbered specimens and a catalogue a great aid to their collecting. My family keeps me so busy that I never have all the time I would like with my collection, yet I do attempt to label fully all specimens. As an amateur entomologist I do not have the time or the facilities to arrange for the printing of individual labels for individual specimens or the listing of much of the extremely desirable data that the professional entomologist may manage. However, I do find it possible to keep a numbered catalogue during the summer—or collecting months—and to transfer the data to labels during the quieter winter months. In fact, I find that mass labelling at the end of the season is far more efficient than batch labelling mixed in with setting and identifying all in one evening during the season. In this way the maximum time is given to the collection and identification of specimens and the majority of the collection is properly labelled.

R. S. GEORGE (1402).

MOTHS VISIT TOWN

Using a 500 watt lamp for attracting moths in a built-up area of a heavy industrial city may seem hardly worthwhile.

I have during the last three summers used this method at my home, which is miles away from woodlands and $\frac{3}{4}$ mile to the nearest meadow.

Yet several hundreds of moths have come in; 77 different species (mentioned in South's *Moths of the British Isles*). Best night was July 31st/August 1st, 1948, when 33 species were recorded.

Nothing classed as rare appeared, but some must have wandered quite a way from their breeding haunts.

The Dot Moth (*Melanchra persicariae*) was new to the local Society's records, as was also the Limespeck Pug (*E. centaureata*).

The following paid only one visit to my light and are hardly likely to have bred nearby:—

True Lovers Knot (*Lycophotia varia*).
Lesser Broadborder (*Triphaena janthina*).

Mouse (*Amphipyra tragopogonis*).

Powdered Quaker (*Orthosia gracilis*).

The Sallow (*Cirrhia icteritia*).

The Shark (*Cucullia umbratica*).

The Tissue (*Triphosa dubitata*).

Northern Spinach (*Lygria populata*).

The Chevron (*L. testata*).

July Highflyer (*Hydriomena furcata*).

Foxglove Pug (*Eupithecia pulchellata*).

Many a suburban collector will have taken more species in one night, but for the collector who dwells in the heart of a city there is still enough to keep one quite busy till nearly dawn; while there is always a likelihood of something unexpected popping in—apart from stray policemen, cats and even hedgehogs.

J. BRIGGS (832).

COLLECTING NOTES

Insects on Rowan Berries

I do not have much time to give to my collection or to collecting; I am, therefore, all the more pleased when I come across a good spot. Last summer (1949), my first given to beetles, I had a pleasant surprise in an Ilford garden.

On examining a bunch of berries on a Rowan Tree I found several species of Ladybirds. This caused

me to search the whole tree, when I found:—

	8/8/49	12/8/49
Ladybirds	147	41
Dermaptera	23	4
Hemiptera - Heterop- tera	21	0
Diptera	4	5
Arachnida	12	8

All the specimens were removed on August 8th, so the figures show a 27.2% recolonization by the Ladybirds and a 28.5% recolonization by the other groups in four days.

The Ladybirds were:—

	8/8/49	12/8/49
<i>Coccinella bipunctata</i> (type or near) ...	119	40
<i>C. bipunctata</i> (Joy 151 ²)	1	0
<i>C. 7-punctata</i>	5	0
<i>C. 10-punctata</i> (Joy 151 ⁷)	1	0
<i>C. 10-punctata</i> (Joy 151 ⁸)	3	1
<i>C. 11-punctata</i>	1	0
<i>Adalia 10-punctata</i> var. <i>bimaculata</i>	5	0
<i>A. 10-punctata</i> var. <i>guttato-punctata</i>	12	0

Another tree, examined for Ladybirds only, on 12/8/49 gave:—

<i>C. bipunctata</i> (type)	40
<i>C. 10-punctata</i> (Joy 151 ⁸)	4
<i>A. 10-punctata</i> var. <i>bimaculata</i> ...	2
<i>A. 10-punctata</i> var. <i>guttato-punctata</i>	3

As I could not find any aphids on either tree, though other plants in the garden were infested, I am rather puzzled by the large numbers of Coccinellids present.

Mr E. B. Britton of the B.M. (N.H.), who identified the *Adalia* spp. for me, suggests that the aphids may have been numerous when the beetles were present as larvae. He also says that Coccinellids are known to congregate in vast numbers in winter.

Mr Britton also gives the full names of the figures from Joy's *Practical Handbook of British Beetles*, referred to above, as:—

Plate 151, fig. 2. *Adalia bipunctata* L. var. *sevpustulata* L.

Plate 151, fig. 7. *Adalia decempunctata* L. var. *octopunctata* Müll.

Plate 151, fig. 8. *Adalia decempunctata* L. near var. *consita* Wse.

R. S. GEORGE (1402).

THE RINGLET

Aphantopus hyperantus Linn. 1758

To the field collector this is a very interesting species as it embraces so many varietal and aberrational forms. By varietal, I mean those forms that recur every season, and by aberrational, the forms that occur only rarely and are of unusual and novel character.

There are striking forms (see Plate) that occur regularly every season as undersides, namely:—

1. var. *arete* Müller.
2. var. *caeca* Fuchs.
3. var. *obsoleta* Tutt.
4. var. *parvipunctata* (after Lempke).
5. var. *crassipunctata* (after Lempke).
6. var. *magnipunctata* Burkhd.
7. var. *lanceolata* Shipp.

Descriptions: Undersides

1. var. *arete*. Minute white and other very small spots on fore and hindwings. Occurs not uncommonly in all districts where the species occurs.
2. var. *caeca*. In this variety the spotting is similar to that in *arete* but is confined to the hindwings, the forewings being immaculate. This form is much rarer than *arete* especially in the females. In the past some confusion has occurred between the two above forms but the descriptions given conform to the original ones made by Müller and Fuchs.
3. var. *obsoleta* Tutt. This is a form which is absolutely spotless on all four wings and in my experience extremely rare. In most of the examples so named that I have seen, there is usually one tiny white spot, often faint on account of wear.
4. var. *parvipunctata*. This is a form in which the full complement of spots is present but they are exceedingly small; it occurs freely everywhere.
5. var. *crassipunctata*. In this variety the spotting is complete and considerably larger than the type. It is not uncommon in all districts, but more prevalent in the West Country.
6. var. *magnipunctata* Burkhardt. The spots in this form are abnormally large and surrounded by prominent golden buff rings. The spots are as large as those on extreme examples of *ab. lanceolata* (the next form) but instead of being pear shaped, are round and the small white spot in the centre is not elongated as in *lanceolata*. This form is, so far as my own experience and enquiries show, confined to the West Surrey district, where it was first taken by Col. V. R. Burkhardt. I have since caught and bred others from typical females in the same habitats. It is a particularly striking and beautiful variety and is very rare.
7. var. *lanceolata* Shipp. A form in which the spots are abnormally large and pear shaped with the central white or bluish point lengthened into stripes which may extend as much as a $\frac{1}{4}$ inch. It is rare but occurs in most of the districts where the type flies in the southern counties. I have not heard of it occurring in the northern counties. The New Forest is probably the most favourable place for the form and many very fine examples have come from there. It is a very striking form and affords a great contrast to the *obsoleta* forms.

There are many other recurrent forms such as *ab. vidua* Müller. This has two spots on the forewings instead of the typical three. Also *ab. arcuata* Zusaneky, in which a clearly visible line exists on all four wings near the centres.

Aberrational and Unusual Forms

These are very rare and few really striking forms have been recorded. The species is subject to albinism, but I have not seen a complete example. Several beautiful specimens of a light fawn ground colour have been taken but such colour forms are exceedingly rare. I have seen some half dozen of a very striking homeotic form in which black patches and areas of golden buff appear on the underside. An example is shown on the plate accompanying this paper. Another aberration has all the spots on the underside entirely buff and without the usual white centres. I have seen two examples, one of var. *lanceolata* and one of var. *magnipunctata*, in which the spots on the upperside show as prominently as those on the underside. An example of this latter is also shown on the plate.

I have no knowledge or record of a gynandromorphic example. Professor Lempke, of Amsterdam, gave a long list of varieties and descriptions in a paper published in the Belgian magazine *Lambillionère* in October 1935, and I understand that the South London Entomological Society have in preparation a very comprehensive paper by Mr H. A. Leeds which he presented to it some years ago with some coloured plates. This paper will be of the greatest assistance to those who are interested in the species, and may have the effect of standardizing the nomenclature.

The various forms of the spotting, on the underside especially, are very interesting, and I have examples with as many as four to eight spots.

I should be pleased to have details from any member of any form which he considers unusual.

SPECIMENS ILLUSTRATED ON PLATE.

- | | |
|---------------------------------|--------------------------------|
| 1. Var. <i>arete</i> . | 6. Var. <i>magnipunctata</i> . |
| 2. Var. <i>caeca</i> . | 7. do. do. (upper side). |
| 3. Var. <i>obsoleta</i> . | 8. Var. <i>lanceolata</i> ♂. |
| 4. Var. <i>parvipunctata</i> . | 9. do. do. ♀. |
| 5. Var. <i>crassipunctata</i> . | 10. Homeotic aberration. |

S. G. CASTLE RUSSELL (119).

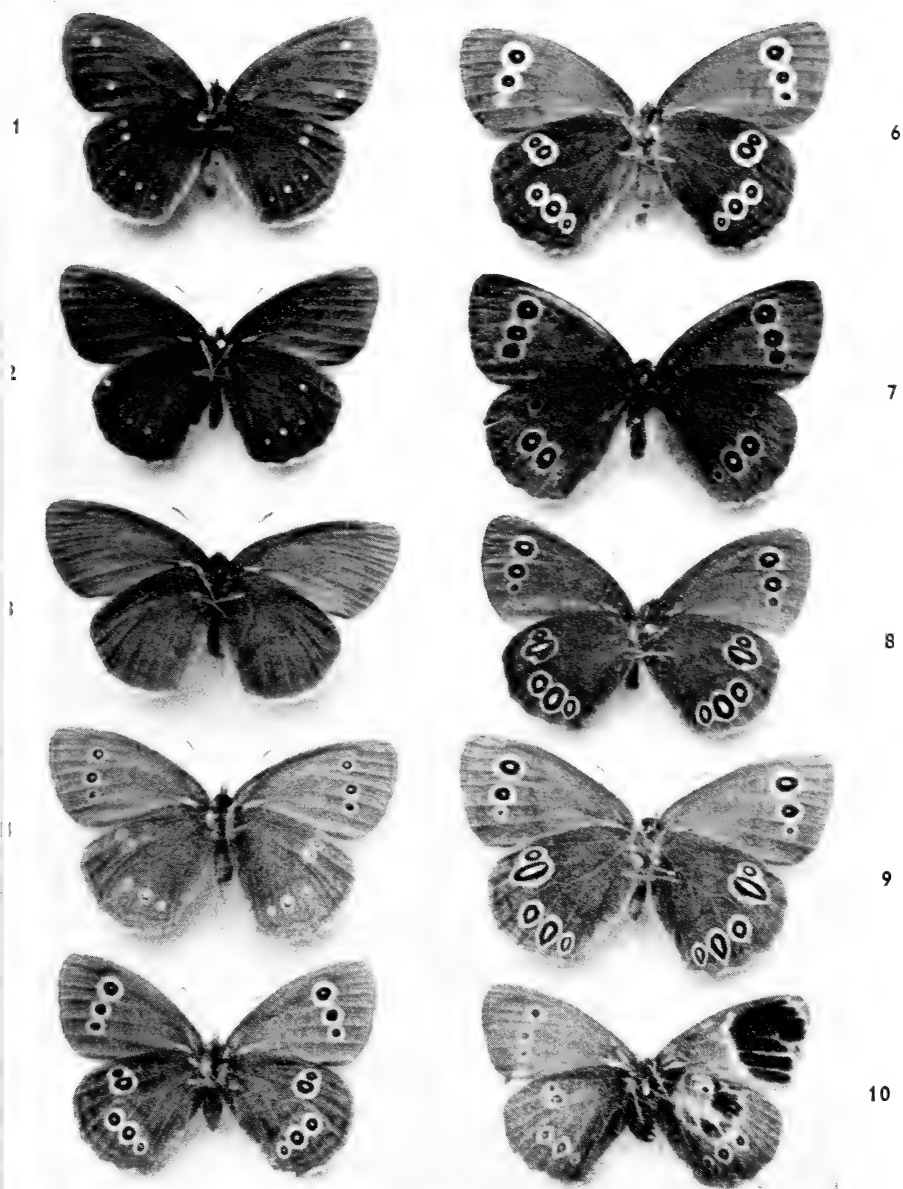
A STREAM IN ZULULAND

I have been able to visit this stream fairly regularly for two winters and one summer, since I have been out here for eighteen months. This district, Ngutu, is 4,500 ft. up, so is on what is called the high veldt; as the name "veldt" implies, it is a grass country, but grass of a poor quality growing on boulder-covered mountain sides. There is hardly any indigenous vegetation, most of the trees there are imported (Australian) Wattle or Gum.

The stream is a mountain one but, in spite of this, is not for the most part swift, since it runs its course by dropping down a series of small waterfalls with level stretches in between. In the level stretches it is never more than a foot wide, often less, but at the foot of each of the cascades there is usually a small pool. It is mostly flanked by rock, but there are stretches where grass and rushes grow with a few flowering plants of the Water Plantain type, and a few parts where it is entirely shaded by Wattle trees. Such is the stream where most of my insect hunting has been done.

My chief interest is in the Dragonflies, wherein I had a most pleasant surprise for, knowing beforehand that the district was a dry one, I had expected to find very few species. Actually I have taken thirty species on this small stream, three-quarters of the total number to be found in the British Isles. Not only is the number of species large but many of them are present in considerable numbers. Season, of course, makes a marked difference to their presence; October to January are the best months, but there is no time of the year when Dragonflies are entirely absent.

I arrived in Ngutu at the end of April, so that my first collecting was done in May, which is well on into the autumn here. During that month I took the pretty little *Palpopleura jucunda* Ramb.; *Orthetrum affrum* Burm., closely resembling our *O. coerulescens*; that lovely scarlet *Crocothemis erythraea* Brullé; the beautiful *Helothemis dorsalis* Ramb., an insect about the size of an *Orthetrum*, but with the whole body and wing veins dark blue; a Lestid twice the size of our English one and *Enallagma glaucum* Burm., in general appearance much like our own *Enallagma*. All these insects taken in May are present in larger or smaller numbers throughout the year.



Variation in *Aphantopus hyperantus* L.
(see p. 33).



Two other British genera are represented on this stream; *Aeschna* and *Anax*, of each of which there are two species. Both *Aeschnidae* bear much resemblance to our *Aeschna cyanea*, but are rather smaller; one *Anax* (*A. imperator mauricianus* Ramb.) is a replica of the English *Anax*, except that the abdomen appears to be a deeper blue, but the other, *A. speratus* Hagen, is a very different insect, being larger (wing expanse 114 mm.) and wholly brick red; it is a fine sight as it hawks in a straight line up and down the stream. Among the genera which do not occur in England are *Pseudagrion*, insects rather larger than *Coenagrions*, mostly having dark bodies with a blue tip to the abdomen and having green or orange thoracic strips; *Chlorolestes*, superficially like our *Lestes*, but twice or three times the length; *Trithemis*, usually scarlet; *Allocnemis*, of which *leucosticta* Selys is a glistening black insect with an orange tip to the abdomen and white stigmata. This last is rather slow moving with a habit of flying slowly up and down after the manner of gnats; while so flying the white stigmata describe very prettily figures of eight. I have taken males, but so far only males, of one of the *Gomphidae*, *Mesogomphus cognatus* Ramb. Lastly, I must do more than merely mention *Chlorocypha calligata* Selys; this dragonfly has expanded tibiae like our *Platynemus pennipes* Pallas, but in the African one the anterior aspect of the expansion is shining white while the posterior side is bright red, giving the insect a most striking appearance as it rests on a grass stem; its thorax is marked with rich brown and the abdomen is powder blue. So far I have seen and taken males only on this stream, though I have females from another locality.

Next to the Dragonflies my interest lies with the Beetles. The most apparent on the stream are the *Gyrinidae*, or Whirligigs, which are much more plentiful than in England and are perennial; every pool and every stretch of smooth water, however small, has its whirling crowd at all times of the year. I well remember my excitement on first seeing the giant of the tribe, *Dineutes africanus*; until I had caught and examined it I could not believe that it really was a Whirligig, for the average size is 15 mm. So far I have taken six species, three about the size of our English ones, the giant I have already mentioned and two intermediate in size. Four of them are bronze black, though one is coated with very short golden hair, the other two are metallic green with a yellow border.

So far I have seen none of the large *Dytiscidae* such as we are familiar with at home, but I have four species of moderate size, black with varied yellow or brown markings. Among the small ones I have about a dozen species of *Dytiscidae* and nearly as many *Hydrophilidae*. Unfortunately I have not so far been able to get any of them named.

On the whole I find semi-aquatic beetles less common than at home; by semi-aquatic I mean those obtained by sweeping the stream-side herbage; a few weevils and a few small *Phytophaga* being all I have taken in this way.

Diptera, of course, are plentiful, but are not nearly the nuisance they are in damp places in England. There is a biting Clegg present in small numbers, which is strikingly like our English one. As a group I cannot spare time to collect them (Oh! that one could collect everything!) but I do take anything which appears to be very unusual, for instance, the stalk-eyed flies, of which two species occur on the stream. They are usually in shady spots where they congregate in numbers on some plant such as a large plantain. Each fly has a pair of sharp, hard spines on the thorax. I was completely misled once by what I took to be a Daddy-long-legs and therefore did not trouble to net, but finding one caught by accident I examined it when, to my surprise, I found that it had four equal wings. Dr Hesse, of the Cape Town Museum, kindly informed me that it was one of the *Mecoptera* (Scorpion flies), although it had nothing of the scorpion-like tip to the abdomen.

Hymenoptera, of course, inhabit the dry veldt rather than the banks of the stream but in the few places where there are mud banks many wasps come for their building material. *Ichneumonidae* are plentiful in the summer, while in the spring there are a few Saw-flies, of which I appear to have taken three species, all of the black and yellow (*Athalia*) type.

A small green Cicada is netted occasionally by sweeping damp herbage. May-flies are not uncommon but I have taken only one Caddis-fly.

It seems to me to be difficult to combine entomology with ornithology since, while the former requires one to keep one's eyes lowered, the other necessitates a constant looking upward. I have, however, managed to see two species of ibis, the Green Ibis, which is very common, and the Bald Ibis, which is said to be

rare; there is, however, a small colony of them nesting high up on the rock over which this stream flows near its beginning. Kestrels are fairly common and I once disturbed a large flock of guinea fowl. Sun-birds are said to occur on the stream but so far I have not seen them.

Frogs are very plentiful in this stream as indeed I believe they are throughout Natal; certainly this is true if one can judge by the nightly chorus we hear in the village, a chorus which is by no means a chorus of discordant croaks but as of little musical bells. As one walks along the bank of the stream, every few yards a frog goes plop into the water: one seldom sees them as they are at once hidden by a cloud of mud. On one occasion, however, I found two resting unconcernedly on some floating vegetation, one was about the size of our English one but light green prettily variegated with light brown, the other, much larger, was a deeper green marked with bold black spots. Some of the tadpoles which I find in my water net are enormous.

On three occasions I have disturbed an iguana; once I nearly dropped on to the back of one as I jumped from the bank on to the bed of the stream; but I have not yet seen a snake.

A. H. NEWTON (1140).

BUZZING OF INSECTS

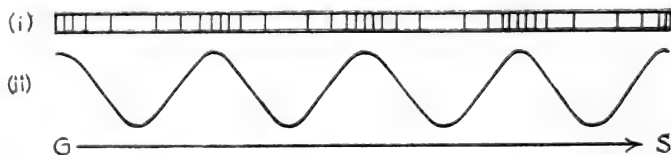
I can offer an answer to part of Mr Vaughan Roberts' query regarding the buzzing of gnats and of insects in general. (Reference *Bulletin* 89, p. 148, January 1948; *Bulletin* 92, p. 207, June-July 1948.)

A theoretical explanation may be offered to account for a fall in the pitch of a mosquito's buzz as it recedes from its victim, even though the insect's wings beat at a constant frequency. (The same theory would not explain so easily a rise in the buzz pitch as the gnat approaches the observer. Any such apparent rise may, however, be an "aural illusion", due to the increasing amplitude (volume) of the buzz rather than to an increase in its frequency (pitch), as the gnat comes nearer.) This explanation depends only on the assumption that the gnat does not fly in a straight line away from the observer.

The perception of sound by the human brain is due to the vibration of the ear-drum. This vibration, in turn, is due to rhythmically repeated changes in the pressure of the air that is in immediate contact with the outer surface of the ear-drum. So long as the rhythm—that is, the time interval between moments of (relatively) high and (relatively) low air pressure—is unchanged, we hear the same steady note. The important point is that what matters is the rate of change (with respect to time) of pressure at the ear-drum. The significance of this will appear presently.

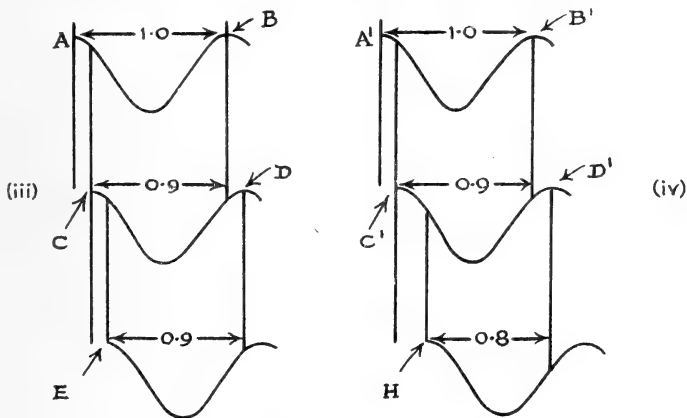
Let us suppose that a gnat is somehow clamped in a miniature vice, so that although unable to come any nearer to the observer, it can flap its wings freely. The vibration of its wings at their usual speed will then set up a train of waves in the air, consisting of a succession of alternately high and low pressure zones, which will travel outwards in all directions in a geometrical pattern resembling the successive layers of an onion skin. These waves, having a constant time interval between each peak, will on reaching the observer's ear produce the steady note described above.

Let us concentrate on the waves travelling in a straight line towards the observer. This particular train of alternately high and low air pressure zones may be represented diagrammatically in either of two ways, the first more descriptive pictorially, the second more useful analytically. Both types of diagram represent imaginary instantaneous photographs of a cross-section of the air-space between the gnat and the observer. (The gnat is supposed to be situated at G, and the observer at S.) In Fig. (ii) the height above GS of any point in the wavy line is proportional to the density of the air at that distance from the gnat (and at that moment), as depicted in Fig. (i) immediately above that point.



Suppose now that the gnat is released, and that it flies towards the observer at S. Suppose further that the frequency of the wing beat is constant, at one cycle (beat) per millisecond ($1 \text{ millisecond} = 1/1000 \text{ second}$), and that the gnat flies $1/10$ foot each millisecond. Then since sound travels through air at a speed of 1000 feet per second (approximately)—i.e. 1 foot per millisecond—the gnat moves through $1/10$ of a wavelength each millisecond. (Admittedly this speed of flight is unrealistic, but it simplifies explanation.) Then, 1 millisecond after the gnat has been freed, the high pressure zone of air generated just before the release will have travelled 1 foot towards the observer: the wave peak will have moved from A to B (Fig. iii). But in this same millisecond the gnat will itself have travelled 0.1 of a foot from A to C (assuming that the wing down-beat that generated the peak at A gave the gnat enough momentum to carry it to C.) It follows that the next high pressure zone, generated when the gnat is at C, is not 1 foot, but only 0.9 of a foot, behind the preceding peak A (which, it will be remembered, has now reached position B. The peak that was at B has, of course, simultaneously advanced 1 foot towards the observer, and so have all the other peaks that were in front of B.) This means that the buzz frequency as picked up by the observer's ear has risen from 1000 cycles per second to 1110 cycles per second, although the gnat's wings still beat at 1000 c.p.s. This follows from the relationship between wavelength, the number of wavelengths per second (frequency), and the speed of sound: $\text{Wavelength} \times \text{Frequency} = \text{Distance travelled per second}$. It follows: $\text{Frequency} = (\text{Speed of Sound})/\text{Wavelength}$ and $1110 \text{ c.p.s.} = 1000 \text{ ft. per sec.}/0.9 \text{ of a foot}$.

In the next millisecond, again two movements take place: the high pressure peak just generated (C) travels to D; and the gnat itself, with the momentum it derives from this single wing beat, advances to E, where it again beats its wings downwards. But this time, the observed buzz frequency does not again rise. The gnat is still 0.9 of a foot behind the next nearest peak (D).



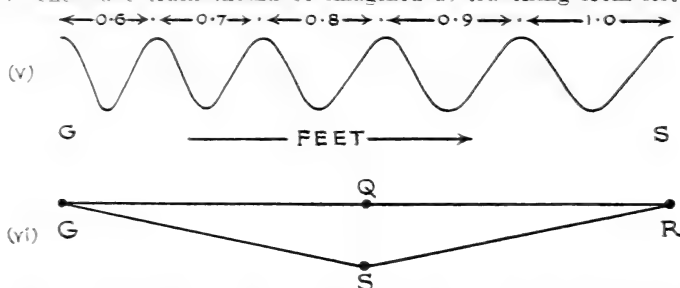
If, however, the gnat approaches the observer at an *increasing* velocity*, then the buzz as heard by the observer will increase in pitch continuously, until the gnat either lands or begins to recede. The fourth set of diagrams (Fig. iv) illustrate this phenomenon (Döppler's Effect). As before, during the first millisecond after its release from the vice, the gnat advances 0.1 of a foot relative to the position of the first high pressure peak at the end of that time interval. The distance between this peak and the next is thus 0.9 of a foot, and the frequency 1110 c.p.s. (as in the previous case).

During the next millisecond, the gnat advances 0.2 of a foot, from C' to H, while peak C' advances to D'. Hence the distance between the new position of the peak—namely D'—and the gnat is 0.8 of a foot (compared with 0.9 of a foot when the velocity of the gnat relative to the observer remained steady at 0.1 of a foot per second). It follows that the observed frequency of the buzz will again rise, from 1110 c/s to 1250 c/s ($0.8 \text{ of a foot} \times 1250 \text{ c.p.s.} = 1000 \text{ feet per second}$).

*This increase in velocity must be assumed to be due to a change in the angle of inclination of the wings and not to a change in the frequency of flapping.

During the following millisecond, the gnat will move 0.3 of a foot—assuming that each millisecond the gnat flies 0.1 of a foot faster than in the preceding millisecond—while the peak H will move 1.0 foot, and the distance between the two peaks will again fall, this time to 0.7 of a foot, corresponding to a frequency of 1430 c/s.

The effect of this continued fall in the buzz wavelength is illustrated in Fig. v. The wave train should be imagined as travelling from left to right.



By similar reasoning, it may be shown that if the gnat approaches the observer at a *decreasing* velocity, or if it *recedes* from him at an increasing velocity, then the wavelength between successive peaks of the observed buzz note will increase; that is the frequency of the note will fall. If the gnat recedes at a *decreasing* velocity, then the wavelength will fall and the frequency will rise.

Consider now the case of a gnat flying at a uniform speed in a straight line *and* the observer, as shown in Fig. (vi). Then when the gnat is at G its speed in the direction of the observer (GS) is nearly the same as its speed in the direction of its flight (GR). When the gnat is at Q, its speed in the direction of the observer (QS) is zero: the gnat is getting no nearer to S. Finally, as the gnat flies beyond Q, towards R, its speed of recession from S increases from zero to nearly the speed of flight along GR. The important thing is that, although the gnat flies along GR at a uniform velocity, its velocity *relative to S*, a point off the straight line GR, first falls and then rises. Thus, as the gnat flies away from the observer at an increasing velocity *relative to him*, the converse of the Doppler Effect as described above will occur: the distance between successive high pressure peaks will lengthen, and the pitch of the buzz (as heard by the observer) will fall. When the gnat is approaching the observer in the way shown in Fig. (vi) the falling speed of approach will reduce the pitch of the observed buzz note, but the increasing loudness of the buzz as the gnat comes nearer is likely to obscure this fall in frequency.

If the gnat changes the speed of its wing beats as it prepares to land, or as it "climbs" after having "taken off", then the observed buzz note will, of course, vary directly in sympathy with the change in the wing beat frequency.

With regard to the use of buzzing for distance perception, there is an important difference between bats and mosquitoes (or any other insect). Bats emit clear-cut "pips" of sound, each pip separated in time from the next. Consequently the echo due to any one pip can be picked up before the next pip is emitted. If a bat does use "radar", this separation of pips enables it to gauge the time taken for each pip to travel out, be reflected by some obstacle, and travel back to the bat's ear. If it "knows" the speed of sound, then it "knows" how far the pip has travelled in the measured time. Insects, on the other hand, emit a continuous note, so that it would be difficult to time any particular "piece" of that note and its corresponding echo. There are, however, other ways in which a continuous-wave note could be used for distance perception:—(a) the amplitude of the echo would rise as the insect approached a reflecting surface, and so the loudness of the echo would give some indication of how near "land" was; (b) a Doppler echo, of varying frequency, would occur if the insect approached the reflecting surface at a changing velocity. Then, (bi) the rate of change of this echo would depend on (and therefore indicate) the speed at which the insect was approaching "land"; (bii) the echo signal might become mixed with the original buzz note, and produce a new "beat-note", whose loudness and/or pitch the insect might be able to interpret.

It is up to the experimenters to say how far any of this theorising is relevant to the real insect world.

W. N. T. ROBERTS (77).

ABNORMALITY IN THE HOUSE CRICKET

Among a number of specimens of *Gryllus domesticus* put out for class dissection some years ago, I found one which had the tergum of one of the abdominal segments split into two distinct terga on one side only, the sternum showing no abnormality. I cannot find any reference to such an abnormality in the literature of insect teratology.

The specimen is still in existence but has been temporarily mislaid, and Fig. 1 is therefore only diagrammatic, but shows the state of affairs quite clearly. HENRY G. MORGAN (90).

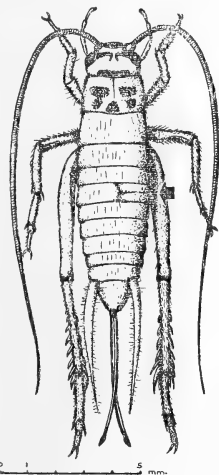


Fig. 1.

IMMIGRANT RECORDS

G. VICTOR DAY (29), referring to the notes on p. 6 of *Bulletin No. 109*, (Jan. 1950), further reports that Mr John Fenn, of Stoke Ferry, received a living pupa of the *Convolvulus Hawk Moth* on Jan. 20th, 1950. It was found on a farm near Wisington Beet Factory, while forking out a furrow which had been ploughed out of the border of a field. The Death's Head pupae mentioned in the same note were placed on bulb fibre in a biscuit tin and put in a warm corner near the fireplace. The moths all emerged during late September and early October, between the hours of 10 p.m. and midnight. In the case of the first emergence I was able to watch the expanding and drying of the wings from the time of struggling from the pupa to the final folding of the wings over the back. The time

taken was $1\frac{1}{2}$ hours. All the moths squeaked rapidly and continuously on being touched, the sound being similar to that emitted by a bat or shrew mouse. Mr Day has also reared the Swallow-tailed Moth to the perfect state on Jan. 3rd, 1950, and the Small Copper Butterfly on Jan. 18th, by placing November-collected caterpillars in jam-jars and bringing them indoors.

THE HEATH FRITILLARY— *MELITAEA ATHALIA*

This butterfly is one of the Fritillaries which is likely to remain uncaptured by those of us who reside away from the South-East corner of England. Its headquarters are in the extensive woodlands of North Kent, where it seems very widespread and abundant. It has the habit of moving its haunts from year to year as the various sections of the woods are cleared. Cow-wheat (*Melampyrum pratense*), its food-plant, is found in clearings. As the cleared areas become overgrown again, the plants die out and establish themselves in other more recently cleared areas.

The species is also to be found in a similar location in South Essex, but judging by its appearance on 20-6-49 it is not very well established there. The uninitiated might have gained an impression of abundance, but it is extremely colonial and seemed confined to an area of some two acres only. It should be remembered that a hundred butterflies confined to a small area will appear much more abundant than a hundred times that number spread over a whole county. Although the cow-wheat was extensive there was no evidence of the butterfly having spread to the surrounding clearings. There is little difference between the Essex form and that found in Kent, and local variation was slight—unlike Kent, where considerable local variation can be found. Taking everything into consideration, leave the Essex locality undisturbed and pay a visit to Kent if you wish to take a series.

Apart from reported colonies in Devon, with which I am unfamiliar, and one that used to exist in Sussex, the foregoing appear to be the only localities known. However, one specimen was captured this year, and also one in 1948, in north-east Hampshire. In spite of a thorough search of the area no trace of a colony could

be found. Fair quantities of the foodplant were noted but no really suitable looking clearings. The specimen recorded on 25-6-49 was reasonably fresh and the day was bright and sunny. A report from any member in a position to throw any light on this odd appearance of one isolated example in each of two years would be appreciated.

P. LE MASURIER (978).

MORE PREDATORY WASPS

I read with interest L. S. Beaufoy's article on pairing moths in captivity (*Bulletin No. 105*, p. 66), and especially his observations on leaving the trap outside during the day.

During August 1949, I attempted to pair several Speckled Wood (*Pararge aegeria*) varieties in a large cage out of doors. The cage had netting sides, top and front, with asbestos board for the back. A hole about $\frac{3}{8}$ inch diameter, normally used for hanging up the cage, was, unfortunately, left exposed. I was watching the effect of an artificial shower which I had given the butterflies, when I noticed a vicious beast in the form of a wasp hesitate on the edge of the hole and then fly into the cage. Flying fairly slowly but deliberately, it attacked the nearest butterfly—a female, I believe—snipped off its wings in mid-air, and, after flying once round the cage, promptly flew out of the same hole by which it had come in with the body of my poor *aegeria* between its legs. All this happened in the space of not more than thirty seconds; I was so surprised that I was helpless to do anything about it. However, the hole was soon filled up, believe me. A few wasps had been attracted in the first place by the sugar and water used for feeding, but had passed almost unnoticed.

W. E. RUSSELL (1525).

2.1.1950.

Miss BARBARA HOPKINS (827), referring to R. H. Benson's note in *Bulletin No. 110*, p. 18, says: "I have been rearing the Large White (*P. brassicae*) in considerable numbers and have found wasps to be a great pest. They enter the ovipositing cage by small holes in the muslin and kill many of the butterflies in the manner described in the note. A wasp was

also observed to attack a fullgrown larva, which it stung. The larva put up a good resistance but was finally overcome. The wasp later flew away without cutting up the larva.

REVIEW

A Pocket Book of British Insects, by George E. Hyde (818), with 16 colour plates and 72 photographs; pp. 144. 5"×6 $\frac{1}{2}$ ". Published by A. & C. Black, London. 7/6.

This is the latest of the series of Black's Nature Pocket Books. After a short Preface, by the author, the main body of the book is divided into an Introduction and eight sections dealing with different Orders of Insects. Thus the *Hymenoptera*, *Coleoptera*, *Odonata* and *Lepidoptera* have sections to themselves—the last section is simply "Bugs and some other Insects."

It will be clear that the book is not intended for the specialist. It is all the more important, therefore, that it should be accurate, as mistaken information absorbed by a beginner is difficult to eradicate later. It can be said that, on the whole, the generalizations and detail are reliable; there is in places a tendency to anthropomorphism. When talking of breathing, for example, the author says (p. 8), "air is inhaled and expelled through minute openings or breathing pores." The important role played by diffusion into the finest branches of the tracheae is not mentioned. The author, however, disarms the critic by reminding him of the unwieldy dimensions of a subject which is compressed into less than 80 small pages of print. [The plates, plain and coloured, take consecutive page numbers with the copy.]

The coloured plates vary in quality. Those of the beetles are good but the butterflies are unsatisfactory.

While the coloured plates invite criticism, the half-tone plates from photographs by the author are excellent. The reviewer found the plate of the "Yellow Underwing" Moth's eggs (p. 113) most attractive. [It is to be hoped the next edition will say which Yellow Underwing!]

This book provides a very useful grounding and can be safely recommended to the beginner.

T. T.

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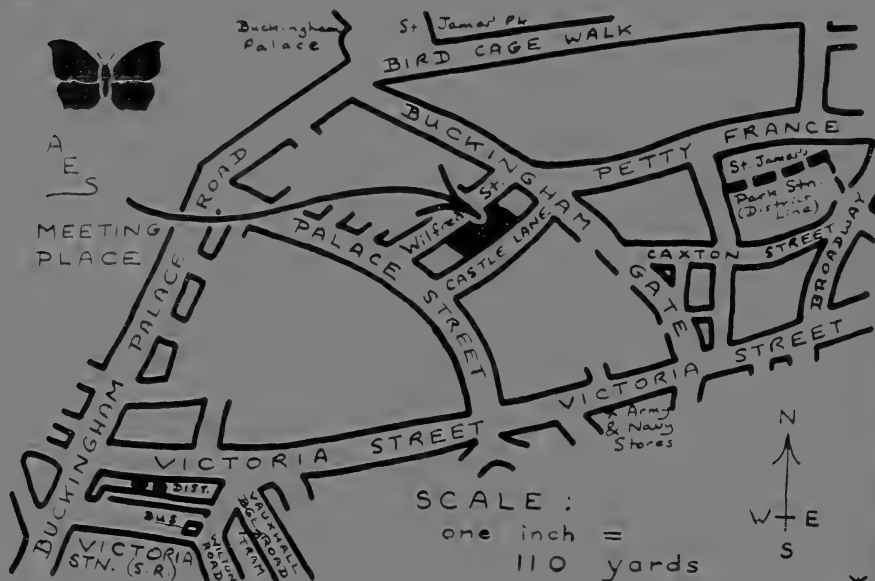
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Annual Exhibition 1950

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THE BULLETIN
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EDITORIAL

Dr Julian Huxley has emphasized the importance of the work done by amateur naturalists in this country. On this page, details are given of an opportunity for some fortunately-placed AES members to take a hand in a piece of research work sponsored by the Department of Zoology in the University of Oxford. Will members, who can assist Flight-Lieutenant P. M. Sheppard, write to him at the Department of Zoology, University Museum, Oxford, for further details?

STUDYING EVOLUTION

When Mendel's work was rediscovered, it was realised that inheritance was particulate, not blending as Darwin in his *Origin of Species* had supposed. Many current ideas about evolution were proved to be wrong, and, consequently, there was a tendency to discredit Darwin's theory. Not till 1925 or later were many of the fundamental problems fully appreciated, as a result of their mathematical treatment by Fisher, Haldane and Wright.

Although the evolutionary theory is now accepted by the majority of biologists, there is at least one point of fundamental disagreement, namely, whether *all* evolution is the result of natural selection, or whether some is *non-adaptive* and the result of chance.

It is possible, mathematically, for gene frequencies to fluctuate in small populations, in such a way that advantageous genes may be lost and disadvantageous ones retained. Beyond this point, the mathematicians can make little headway and it is up to the naturalists and ecologists to find out whether genes do, in fact, spread against the pressure of natural selection. (A gene is inherited from the parents and is the factor which may determine a body character or group of characters—e.g., wing pattern—in the progeny of a mating. Physiological responses may also be affected by genes. One individual carries numerous genes.

Mendel worked with plants, but the principles are similar for animals.)

There are three simple ways in which it is possible to detect the operation of natural selection:—

- (1) By sampling a colony of known size (the size can be calculated in several ways, one being the marking, release and recapture method used by Fisher and Ford) and calculating whether changes in the frequency of known genes in the colony are too large to be ascribed to chance.
- (2) By demonstrating a relationship between the inherited forms of an animal and the environment in which it lives, i.e., the melanic forms of *Biston betularia* L. are very abundant in many industrial areas, but are less common, or uncommon, in most rural ones.
- (3) By demonstrating the presence of a cline, that is a gradient in some character or frequency of some character, correlated with a gradient in climatic conditions.

Since 1940 a colony of the moth *Panaxia dominula* L. (the Scarlet Tiger) has been kept under observation by Fisher and Ford. Recently a new dominant gene has been found in the population and in a neighbouring one. The fluctuations in its frequency are being recorded. That is to say selection is being investigated by the first method described above. It seems desirable to use methods two and three as well. Unfortunately all my time this season will be occupied in determining the population size of the two colonies under intensive investigation. I should therefore be very grateful to hear of any fellow members of the AES who would be willing to help me with the collection of data from other colonies of the Scarlet Tiger.

It is a day flying moth and can easily be caught in those localities where it is to be found. The requirements of the investigation are as follows:—A sample of the moths should be caught, the more the better, up to a maximum of one hundred and provided so many are not caught as

seriously to decrease the number of moths in the colony. The moths should be sent to me, unset, in a box, so packed as to prevent unnecessary damage. When collecting the moths care should be taken NOT to select any because of their condition but to keep all that are caught. I will, of course, return to the sender any that he wishes to be returned.

If the colony is easily accessible to the collector it would be desirable to make a small sample once a week for the four weeks in late June and early July when the moths are on the wing and send them to me separately, if this can be done conveniently. Other points for record are the name and position of the colony, so that it can be plotted on a map, and the type of habitat (river bank, marsh, damp wood, etc.).

I should be very grateful to hear of any member who could help me in this way and I should be very much pleased to give further details of the experiments and results to anyone who would like to have them.

P. M. SHEPPARD (291).

(Note:—Dr E. B. Ford's *Butterflies*, Chapters 9 and 12, should be consulted for a comprehensive, but short, account of this aspect of Evolution.—Ed.)

BEEKEEPING IN THE MOUNTAINS

There is a good deal of difference between beekeeping in the lowlands and in the mountains. If we were to follow some of the rules and advice given in books and lectures, chiefly intended for lowland beekeepers, I am sure that we should not winter our stocks successfully.

The latest advice on hive ventilation in winter is to have a hole in the middle of the quilts or cover board, so that a stream of air may pass through the hive from the entrance. Here we are about 700 ft. up and we get all the winds that blow (not to mention rain). The hive roof must be fastened down securely, otherwise it will certainly be blown off. Two or three years ago I tried this new ventilation method with one hive; the result was that, owing to this current of air, the rain drove in at the entrance during a heavy gale, the floor board became wet and mould formed all over the lower part of the brood box; the food stores below the hole were still uncapped

next spring, the queen was dead and so were nearly all the bees. My other two hives were carefully snugged down for the winter with plenty of thick quilts and no hole. When opened up in the early spring these hives were quite dry and the bees were healthy, in fact, there were already small patches of capped brood. Another difference is that honey is not so plentiful up here as it is in the lowland; owing to frequent rain, the days when the bees are able to collect honey are fewer in number. Nectar cannot be got from wet flowers. Consequently, we cannot separate the honey from say may blossom or fruit blossom and that from white clover, because there is rarely enough of each for the purpose: it has to be mixed together. Hence it is difficult for us to compete with lowland beekeepers at a honey show.

Where heather is plentiful, August and September may be the best months of the season for upland beekeepers, but even then, snags may be found by the unwary.

I remember that we had a very wet late summer a few years ago. Several lowland beekeepers took their bees up on to Denbigh Moor for the heather honey, but they did not make sure that the brood boxes of their hives were well stocked with honey, when they took them up. As soon as the hives were stationed on the moor, the weather broke and prevented the bees from flying. During the short intervals between the rain storms, the heather was too wet for gathering nectar; therefore, when many of the hive owners went up, five or six weeks afterwards, to bring down their stocks, they found their bees dead from starvation.

"Honey, honey, everywhere, nor any drop to drink."

H. HENSTOCK (209).

BREEDING THE VESTAL MOTH IN 1949

Add to my note on p. 23 of *Bulletin* 111:—

Results of 3rd Brood (parents *ex* Brood 2, Part 1):—

Part 1.—75° F. Hatched 15/11, emerged 8-18/12/49. 18 males and 14 females. Two typical males, remainder *ab. labda*. Mortality after half-growth, nil.

Part 2.—60-65° F. Separated from Part 1 on 29/11, emerged 3-22/1/50. 10 males and 10 females. Various shades from coffee to pink, stripes pinkish-brown to sooty. None as Part 1. 8 deformed or failed to emerge.

JOHN E. KNIGHT (94).

POPULATION NOTES

North Kent—The number of butterflies about last summer and autumn in the Gillingham (Kent) area was very poor compared with other years, though Brimstones and Clouded Yellows were more common than usual. The male of the former was a common sight though the female was scarce. The Holly Blue put in an appearance where I had never seen it before, the Chalk-hill Blue was local, and the Common Blue was reduced in numbers. The Gatekeeper was very common (strangely enough) on parts of the North Kent marshes, and along the seawall at Rainham. I did not see, however, more than half-a-dozen Meadow Browns during the whole season. The Grayling was in nothing like its usual strength; this butterfly is very common in normal years, being almost a pest (when one is trying to get a few winks of sleep on a warm chalk bank they *will* persist in settling on one's upturned face). There were the usual number of Skippers, Green Hairstreaks and Walls, but the Small Copper and Brown Argus were fewer. Fritillaries, Small Heaths and Orange-tips were not so common a sight. The Large White population was about normal, but the Small White and, especially, the Green-veined White were not so common. Small Tortoiseshells were common, and there were more Commas and Red Admirals than usual, but the Peacock was almost rare. This latter has been scarce for the last three summers.

ALAN P. MAJOR (1117).

S. G. CASTLE RUSSELL (119) commented, in a letter dated 6th July 1949, from Cranleigh, Surrey, "I have never known butterflies to be as scarce as they are this season."

Scarcity of Vanessids in 1949—With reference to Dr G. V. Bull's article, *Bulletin* 110, p. 17, the following notes may be of interest:—

The two common Vanessids, *Aglaia urticae* and *Nymphalis io*, have been much scarcer in the Surrey-Middlesex area this past summer.

My records have covered this area for several years past, and the following list gives some indication of abundance.

N.W. Surrey and S.W. Middlesex	1946	1947	1948	1949
<i>Nymphalis</i>				
<i>polychloros</i> ...	—	3	—	2
<i>Nymphalis io</i> ...	135	275	199	42
<i>Aglaia urticae</i> ...	181	773	339	117
<i>Polygonia c-album</i> ...	10	18	112	34
<i>Vanessa atalanta</i> ...	47	81	8	18
<i>Vanessa cardui</i> ...	6	16	—	70

Larval nests of *urticae* and *io* were extremely abundant during the summer of 1946, decreasing in numbers slightly in 1947 and 1948, and very uncommon in 1949 when no more than three of each were seen.

Although my *Buddleia* bloomed for a much longer period this past summer (1949), Vanessid visitors were disappointingly few; in fact, it attracted more *cardui* than either *urticae* or *io*.

However, it will be interesting to see what numbers appear in the spring of 1950, because if winter survivals are normal, it would surely indicate the possibility of their having gone into hibernation (or aestivation) unusually early in 1949, as suggested by Mr N. D. Riley in *The Entomologist*.

This habit is well known with *Nymphalis polychloros* and personally I have almost invariably found it to be the case with *Nymphalis io*, as I have rarely seen it on the wing after the middle of August, despite the fact that so many books describe it as an autumn butterfly "frequenting Michaelmas daisy with *urticae* and *atalanta*."

I understand many exotic butterflies aestivate in hot, dry periods, and, after all, 1949 was unusually remarkable in this respect.

B. R. STALLWOOD (1547).

COLLECTING AT STREET LAMPS

I found A. J. H. Duke's account of moth collecting at street lamps (*Bulletin* No. 110, p. 13) very interesting, as I used the same method with great success here in England (Croydon) last year.

On most fine week-ends from May to October I used to go out just before dusk on the Saturday and returned soon after dawn on Sunday; I

went into the fields for an hour or so, then, when the moths there seemed to become less active, reverted to patrolling the lights. As a rule, I covered 6 or 7 miles of lighted streets and lanes during the 6 or 7 hours of darkness and was fully occupied the whole time. I found that moths were flying throughout the night and a few remained on the wing at daybreak. This rather surprised me, as I had hitherto believed that they settled down soon after midnight.

As Mr Duke states, bats are ruthless killers and must devour dozens of moths each night. I have also seen Blue Tits, as soon as it is light, cling to, or hover by the lamp-post and adjacent palings and peck off the settled moths one by one!

I noticed that some lights prove more "attractive" to moths than others, due, I suppose, to more favourable surroundings on which to settle. The busiest month for me was July, when I took or observed over 40 *Micros*, (different) and between 110 and 120 different *Macros*. I have taken 6 of the *Hawks* at light (including 3 *H. convulvuli* in 1947), 6 of the "Emeralds," several "Prominents," and most of the "Hook-tips" and "Thorns." I took a male Lappet moth about a mile from the centre of Croydon! A friend took a Satin Carpet moth (*T. fluctuosa*) on the outskirts of the town in late July. Then in the autumn there are the "Sal-lows" and "Chestnuts," etc.

To conclude, may I point out that if any member intends to try his luck at "the lights" it is advisable to carry his Identity Card, as there are lots of inquisitive policemen patrolling the streets too . . .

DAVID N. BURROWS (1517).

ASSEMBLING EMPERORS IN HAMPSHIRE

Since the assembling of Lasio-campid and Saturniid moths has been accorded considerable attention in the *Bulletin*, it may be of interest that a successful field demonstration of the assembling of male Emperors (*Saturnia pavonia*) to captive females was staged by the Entomological Group of the Alton Natural History and Scientific Society at Short Heath Pond on the afternoon of 8th May 1949. The demonstration was arranged and directed by Mr H. S. Robinson (1518), F.R.E.S.

The weather was favourable, there being bright sunshine, clear, cool

air and a light south-westerly breeze. According to a report on this field meeting, "the spectators assembled on . . . high ground overlooking the pond in a north-easterly direction. Below them and in front was a patch of heather (the food-plant of the Emperor moth) some 3 or 4 acres in extent and again beyond the pond another patch of similar size, with more heather in the distance . . ."

Operations commenced at 1.45 p.m., when two four-day-old females were released into a large gauze cage, which was placed near the top of the bank to take advantage of the breeze.

At 2.5 p.m. the first wild male arrived, to be followed within seven minutes by two more; subsequently, males arrived singly at 2.40, 2.55, 3.5, 3.15, 3.25, 3.35 and 3.45 p.m., when the two females were released "and allowed to mate peacefully." It was remarked that all the males assembled were fine specimens, apparently newly emerged. Flying slowly, their flight described as "fluttering" rather than "buzzing," the males were usually observed "at a distance of about 50 yards . . . quartering the ground as they came . . . up wind. Their traverses were noticeably shorter as they approached the cage, suggesting that the scent beam narrowed in conformity with a wind-borne emission from the cage. None . . . appreciably overshot the mark as described by Henri Fabre, though two or three did fly round the cage once or twice, but this may have been due to the close proximity of spectators who were sitting and standing round smoking and talking. Most of the males flew the last yard or two straight to the cage and alighted on the down-wind side of it."

I am indebted to the Alton Natural History and Scientific Society, per L. P. Causton (Hon. Secretary), for placing a report on the demonstration at my disposal.

PETER MICHAEL (748).

STRIDULATION OF MUTILLA

Referring to Mr P. W. E. Currie's (p. 1) and Mr C. MacKechnie Jarvis's (p. 10) notes on this subject, *Mutilla* is a well-known and powerful stridulator, the stridulatory organ being formed by the co-operation of the second and third abdominal segments, as the apical portion of the abdomen is alternately thrust out and with-

drawn into the second segment. If the segments of the abdomen be separated, it will be seen that the basal portion of each is conspicuously transversely ridged all round, except that on the third segment this series of ridges is interrupted in the middle of the dorsum by a smooth-looking triangular area. This area, on higher magnification, will be found to be itself extremely finely ridged. When stridulating a hard ridge beneath the apex of the second segment is drawn across these fine ridges with the emission of a high-pitched musical note. It was the vibration thus set up in the whole body that Mr Currie felt when pressing with his finger on the insect's thorax (see also A. H. Swanton, 1878, *Ent. Mon. Mag.*, **XV**, p. 118).

Though different parts of the body are involved the structure of the stridulatory organ is exactly similar to that of so many Longicorn beetles, where a basal rib on the prothorax plays across a finely striated area on the basal (normally concealed) part of the scutellum, well seen in *Aromia moschata*. The difference is that in *Aromia* the single rib plays across the finely ridged area, whereas in *Mutilla* the ridged area moves across the fixed single rib.

K. G. BLAIR (197).

NOMENCLATURE

I commenced my "fair copy" of my rough log book, with records of my captures of moths and butterflies, early in the year and, at the start,

found myself right up against the question of Latin names of the genera. Allow me to give a typical example:—

Elephant Hawk Moth (*elpenor*)

The "popular" books from which I obtain my information give the genus as follows:—

The Moths of the British Isles, by Richard South. *Choerocampa*, (*Eumorpha*).

A *Pocket Guide* (published by Frederick Warne & Co., Ltd.), compiled by W. J. Stokoe based on South's book. *Deilephila*.

Butterflies and Moths, by W. E. Kirby. *Choerocampa*.

A *Label List of Butterflies and Moths* published by Watkins and Doncaster. *Pergesa*.

You will note from my four authorities I have four separate "choices" of genus and I greatly fear that if I consult any further publications my list will be added to!

Personally I have decided to base my notes on Kirby's nomenclature as his index is very comprehensive and methodical.

I still wonder whether it would be of general interest to *Bulletin* readers to ventilate this matter; I presume the differences arise through the scientists not being agreed amongst themselves, but, as I presume Latin names are given in order to avoid confusion, I am unable to make out how "confounded confusion" does not at present exist.

R. H. BENSON (1444).

A BEETLE "EXTRACTOR"

This article is written for those who habitually or from time to time collect insects—particularly beetles—from dung, and for those who would like to do so if it were not such an unpleasant occupation.

I have had occasion recently to collect coprophagous beetles for friends, and having somewhat laboriously picked up a few hundreds, and finding many of them difficult to catch in their messy habitat, I wondered if I could work out an easier method of doing the job. The result is the apparatus here described, which has surpassed all expectations, and eliminated all the unpleasantness associated with the collection of these insects.

All one has to do is to collect likely samples of dung and bring it home in large tins, and dump it into the dung basket of the extractor. Heat is then applied and the inmates seek to escape *via* the killing bottle.

Of course, there can be nothing without labour, and the apparatus takes some time to construct, but anyone who takes the hobby seriously will not begrudge the initial "spadework," and those who are at all handy with tools should experience little difficulty.

As mentioned above, it is the application of heat which does the trick, and I have tried out three different methods, details of which follow. One or all can easily be embodied in the same model if desired, for use to suit circumstances.

For all methods, however, the **funnel box** (A) is the same, and the first thing to do is to construct the pyramid-shaped funnel, which in use is naturally

inverted. The size of this determines the measurements of the whole apparatus, and I made my funnels 10 inches square at the base, running to 2 inches square at the apex, where a flange of about $\frac{5}{8}$ " is left for bending and nailing. The metal used must depend on what is available, but copper or zinc would be best as they do not rust. I made all mine from the tin linings of army biscuit boxes, afterwards giving them several coats of enamel.

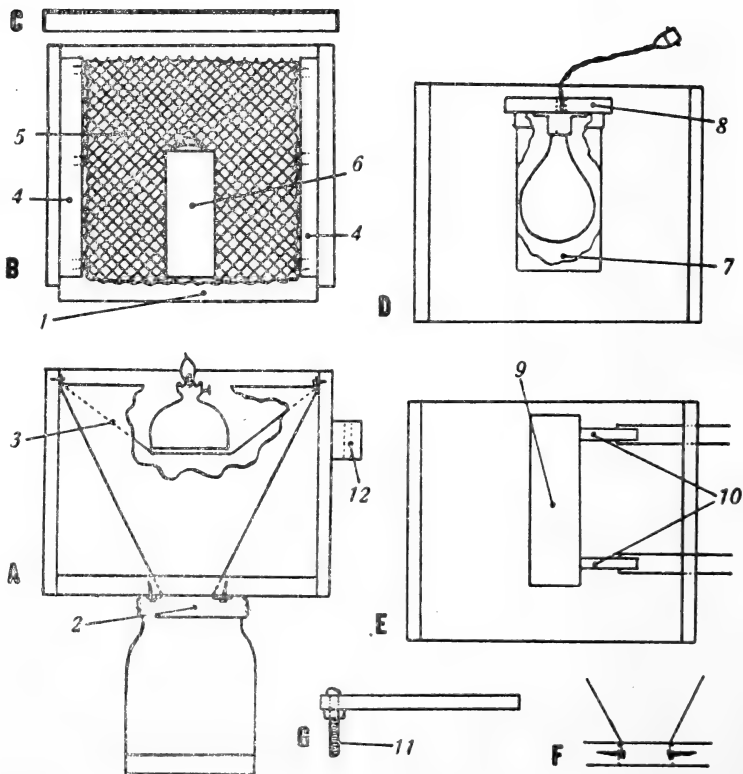
If the base of the funnel is 10" sq., then this must be the internal measurement throughout. Having correctly cut and soldered the funnel, prepare the 10" sq. wooden base of $\frac{3}{4}$ " or 1" timber, and in the exact centre of this cut a 2" sq. hole, in which to fit the funnel. Two ways of doing this are shown at A and F.

The preparing and assembling of the sides is quite straightforward, but it should be noted that they must extend beyond the base of the funnel, as the **upper box** (B, D or E) is metal lined; this lining projects about half an inch below the lower edge of each side (1), so as to engage with the funnel box. (This is not shown at D and E.)

It is as well at this stage to screw the lid of the killing bottle (2) in position. This, of course, has a 2" sq. hole cut in it to coincide with the apex of the funnel.

If an internal lamp is to be used (as shown at A), two crossed strips of baling iron must be attached at the middle of each side (3) to support the lamp. Also, it is advisable to provide for the admission of air to enable the lamp to burn. This can be done by drilling two holes in a suitable position, in which two tubes are inserted, long enough to carry air to the vicinity of the flame.

DIAGRAM OF BEETLE EXTRACTOR



The construction of the outer casing of the upper box (B, D or E) is the same, whatever type of heating is to be used, but constructional details are only indicated at B. Its height must be left to individual taste and requirements. As mentioned previously, it is lined with metal with a flange (1) to engage with the funnel box (A). Two strips of 1" wood (4) are nailed to two of the sides in an upright position (4 strips in all), and to these is fixed the **dung basket** (5), which is made of $\frac{1}{2}$ " wire netting.

The **lid** (C) is simply a sheet of metal, the edges of which are turned down about half an inch to fit snugly over the upper box.

If an internal lamp is to be used for heating, it will be found advantageous to cut the bottom off a metal polish tin and drill a few holes in the sides (6). This is placed in position directly over the flame, and allows for a better diffusion of heat through the dung, which is piled round it.

If one can rely on electricity, the arrangement shown at D will probably prove most satisfactory. It consists of a large cocoa or similar tin (7), to the lid of which is screwed a circle of wood (8). A ceiling adapter is screwed to the inside of the lid and a 60 watt bulb fitted. The body of the tin should have a few holes drilled in it as in 6. It is, of course, necessary to drill a small hole in the lid C, through which to pass the flex, the plug adapter being attached afterwards.

At E is shown a boiler arrangement, (9) being a carbide or similar tin, to which are soldered two 3' lengths of copper tube (10). These are slipped into pieces of rubber tube, which pass through holes drilled in the side of the box, and are connected to similar copper tubes soldered to a larger tin (not shown) which acts as the boiler. It is, of course, necessary to provide a stand on which to place the lamp and a tripod to support the boiler. A suitable shelf is shown at G. It can be held in position by two bolts (11) which slip into two holes drilled in a block of wood (12) which is screwed to the side of the funnel box at the desired height.

Usually it will be found that the application of heat for one to two hours will drive all the inmates down into the killing bottle, but if the boiler is used it takes rather longer. Probably if an acetylene lamp could be used to heat the water it would be quicker. When using the boiler method, do not forget to make a small hole at the top of the boiler to allow for the escape of steam.

It is advisable to place a couple of sheets of newspaper at the bottom of the dung basket before emptying in the dung, to prevent debris falling into the killing bottle. It also helps to absorb excess of moisture.

For a killing agent I use about a teaspoonful of *tetrachlorethane* applying it to the plaster at the bottom of the killing bottle, by which it is quickly absorbed. I have found it very effective.

This extractor could doubtless be used with success for obtaining insects from dead leaves, decaying vegetable matter, carrion or moss. It is certainly a great time saver, for it is much easier and quicker to sort the catch already dead than to try to pick them up alive.

If one is not in a hurry to "extract" the beetles heat can be dispensed with, as most of them will be found in the killing bottle after about 24 hours, even when no heat is applied. At least that was my experience when I tried it out with the killing fluid fairly strong.

A. L. CAPENER (6).

(This piece of apparatus applies the principle of the 'Berlese funnel,' without using the water-jacketing system for heating.—Ed.)

ABSTRACT

Photoperiodism and Diapause in Insects, by M. J. WAY, B. HOPKINS (827) and P. M. SMITH. *Nature*, 164, 615, Oct. 8th, 1949.

Work at Rothamsted on rearing supplies of insects in large numbers throughout the year has necessitated a study of the factors affecting diapause, the quiescent phase in which most plant-feeding insect species spend late autumn, winter and early spring.

Most attention has been paid to the tomato moth, *Diatraea oleracea* L. This insect hibernates as a pupa and a high percentage of pupae in diapause is produced from larvae reared in a glasshouse in spring and autumn, while around midsummer the pupae produced are practically all non-diapause.

When day-length during the larval period was increased to 16 hours a day by the use of artificial light, the number of pupae in diapause produced in

the winter months was reduced to 10-20 per cent. As a result some twenty-four generations of the tomato moth have been reared in the last three years.

The effect of photoperiodism on insect diapause is now being studied in further detail.

Percentages of pupae in diapause for varying periods of artificial light per day in a constant temperature were:—

24 hr.	16 hr.	8 hr.	4 hr.	0 hr.
2	27	100	100	94

It is possible that duration of light affects extent of feeding and that this in turn affects diapause. This and other factors will be studied.

Diapause in *Pieris brassicae* and *Mamestra brassicae* may be prevented by artificial production of long days in winter.

• LABELLING

Recent discussion in the *Bulletin* on this subject has shown there is general agreement that full labelling for every specimen is desirable, but some members maintain that as the time they can spare for entomology is limited, they are justified in using the number and log-book system, which enables them to spend more time on the study of the material.

The practical solution to the problem, then, is to find a method of giving a label to each specimen without laboriously writing them separately by hand. Two such methods are suggested:—

(i) *Photographic Labels*. These are made by writing the data in any convenient size in spaces of the proportions of the labels required and of the plate on which they are to be photographed. The writing is then photographed, using a process plate for greater contrast, and reducing it to the required size. The prints made from the negative are cut up and used as labels. Thus, using an area $3" \times 2"$ on a $2\frac{1}{2}" \times 3\frac{1}{2}"$ plate, one could make 48 identical labels $\frac{1}{2}" \times \frac{1}{4}"$, by photographing one set of data on a card measuring, for example, $4" \times 2"$, in 48 different positions, or any number of prints of 48 different labels.

This method has the advantage that the size of a label does not restrict the quantity of data which can be put on it. A label $\frac{1}{2}" \times \frac{1}{4}"$ may contain a dozen lines of writing which can easily be read with the aid of a pocket lens, and in a shorter

time than if one is obliged to search for a number in a record book.

(An article giving fuller details of the making of photographic labels will appear in a later *Bulletin*.)

ERNEST LEWIS (1952).

• REVIEWS

The Dances of the Honey Bee by K. von Frisch. [*The Bulletin of Animal Behaviour*, No. 5. December 1947. 2/6.]

This is a very welcome English translation by Dr W. H. Thorpe of Professor von Frisch's *Die Tänze der Bienen* published in Vienna in 1946 and unobtainable in this country.

For the past 30 years Professor von Frisch has worked on the problem of how bees can pass on the position of a food source to their companions, and has published a number of papers on the subject.

Briefly, a bee indicates the distance of a source of food by performing a dance on the comb which can be followed by other bees. Up to a distance of 50 metres (of the food from the hive) a "round dance" is performed. From 100 metres onwards a "waggle dance" (*Schwänzeltanz*) is performed; while 50-100 metres is a combination of the two. The number of turns decreases and the number of waggles increases with greater distance.

The direction of the food source is indicated by the direction of the straight run of the dance on the comb in relation to the sun.

The round dance takes the form of a bee running in a circle and changing direction at each complete circle or so. The waggle dance consists of a bee running in a semicircle in one direction, returning in a straight line to its starting point, and waggling its abdomen as it does so, then running a semicircle in the opposite direction.

This is a booklet that should be in the hands of every beekeeper and all those interested in insect behaviour. It provides much material for further study of a very controversial subject.

BRIAN O. C. GARDINER (225).

• CORRECTION

In the article on *The Ringlet* in *Bull.* 112, p. 33, omit "(after Lempke)" in both places and for *parvipunctata*, *crassipunctata* and *magnipunctata*, wherever they occur, read *parvipuncta*, *crassipuncta* and *magnipuncta* respectively.

We Have Great Pleasure In Announcing

“ ENTOMOLOGIST'S GAZETTE ”

Edited by : E. W. CLASSEY, F.R.E.S. and

R. L. E. FORD, F.Z.S., F.R.E.S.

A quarterly publication for the advancement of our knowledge of BRITISH Entomology, in all its branches—especially the Lepidoptera, Collecting Methods, Technique, Literature and History.

We are encouraged to commence this publication in response to constant requests from our numerous friends and acquaintances—who have continually expressed their desire to see in print the subject matter in which we hope to specialize.

Our first issue includes the description of a British species of Lepidoptera new to science: A Lepidopterous larva new to Britain: An outstanding contribution to the methods of collecting insects by Light; being the result of a considerable research in this field and numerous other notes and articles of interest.

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- (c) By friendly co-operation with other members.
- (d) By taking just that extra bit of trouble required to record happenings of note in the *Bulletin*.

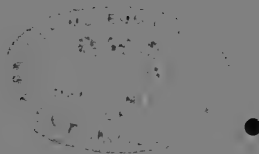
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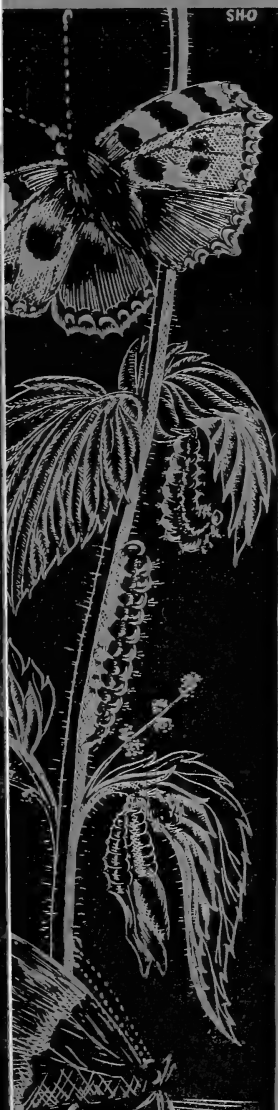


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EDITED by TREVOR TROUGHT, M.A., F.R.E.S.



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AES

No. 114

BULLETIN

JUNE 1950

ANNUAL EXHIBITION 1950

Members will find an advertisement of the Exhibition on the back cover. It is being held in the usual place, the Buckingham Gate Central Schools, Wilfred Street, S.W.1, on the afternoon of Saturday, June 10th. It is hoped that by holding the Exhibition in June, instead of in March, as in previous years, more members will be able to exhibit and more will attend. Do not forget that you can bring your friends, the more the merrier, whether they are members of the AES or not. When *they* see what *you* can do, let us hope they will be inspired to join. We do want more members, if we are to expand our usefulness.

As the advertisement says, label everything clearly and if you want a large amount of space, let the Meetings Secretary, Mr D. P. Golding, know as early as possible. He also wants your offers of help at once.

MAKE THIS EXHIBITION A
REAL SUCCESS

FILM SHOW

The Entomological Film Show took place on the afternoon of Saturday, March 25th, as advertised in the March *Bulletin*, at the rooms of the Linnean Society, Burlington House, London, W.1.

There was an attendance of nearly sixty people, which included quite a number of our younger members. The films had been specially selected to cover a wide range of natural history, so that there would be something of interest for everyone. From the applause given at the end of the show it was obvious that they had been very successful, and our thanks must be given to Mr Byerley for making all the necessary arrangements with Messrs Kodak Ltd.

SPECIAL GENERAL MEETING

After a short interval, the Special General Meeting took place to consider the clarification of Rules 16

(paragraph three), 17 and 29 of the Constitution and Byelaws of the Society. (Full details were sent to all members.) The Treasurer, Mr Le Masurier, explained that the proposed alterations to rules 16 and 17 were to define exactly the point in time at which a junior member ceased to be a junior member for the purposes of the annual subscription. The President, Mr C. B. Pratt, pointed out the obvious necessity of the slight change to rule 29.

The adjustments to the three rules were proposed, seconded and passed. These alterations, having been passed by the S.G.M., must now be confirmed by postal vote (Rule 9), and published in full in a future issue of the *Bulletin*.

ANNUAL GENERAL MEETING

Immediately following the S.G.M. the A.G.M. was held, and the President, Mr C. B. Pratt, drew the attention of members to the fact that at the last A.G.M. the Council had been asked to look into the question of the advisability of not publishing *Journals* in future years but of increasing the size of the monthly *Bulletin*. The President said that when it was found necessary to increase the subscription from 5/- to 10/- it was considered that the annual *Journal* could be provided out of the increased income thus obtained. In fact, the funds necessary for 1947 and 1948 have been reserved and these *Journals* will be sent to members entitled to them as soon as editing difficulties can be overcome. One is the *Coleopterists' Handbook* and the other a composite journal, both well advanced in preparation. In 1949, owing to the most efficient work put in by Mr Trought it had been possible to produce a full programme of *Bulletins* but printing costs have risen still further and this *Bulletin* programme is absorbing the whole of the Society's subscription income.

The Council has therefore decided that articles which, in the past, have been reserved for annual *Journals* will

appear in the *Bulletin*, and that there will be no separate *Journal* in future.

Mr Pratt concluded his statement by calling members' attention to the fact that since the size of the *Bulletins* must be limited by the income from subscriptions, it was very important to get more members.

Mr Syms, our representative on the Insect Preservation Committee, gave an interesting account of the work of that body with particular reference to the Large Blue, Large Copper and *Sedina buettneri*.

The Council nominations as given in the circular sent with the March *Bulletin* were moved and Officers and Councillors duly elected, as follows:—

Officers

President—W. J. B. Crotch.
Vice-Presidents—C. B. Pratt and B. L. J. Byerley.
Secretary—S. M. Hanson.
Editor—T. Trought.
Treasurer—P. C. Le Masurier.
Meetings Secretary—D. P. Golding.
Publicity Secretary—E. Lewis.
Youth Secretary—K. H. Bohe.

Councillors

G. J. Cartwright, B. A. Cooper, P. J. Cousins, C. H. Ison, M. H. Port, H. K. Airy Shaw, L. W. Sigg, T. R. E. Southwood, L. R. Tesch.

The Secretary's report and that of the Treasurer were read and adopted. (These appear later in this *Bulletin*.) These were followed by a few words from our Publicity Secretary, Mr Lewis, who asked members to support our advertisers in the *Bulletins* when possible, so that the Society may continue to profit from this source of revenue.

Mr Port, the retiring Youth Secretary, stated that, although the proposed exchange visits between the Junior AES members and their counterparts in Switzerland had not yet materialized, he hoped that this might be possible in the not too distant future.

Before the meeting closed, Mr Trought said that he would always be pleased to have constructive criticisms from members about the *Bulletin* and also notes on any particular type of article which appealed to members. But it was most important that members write more articles.

The A.G.M. ended with a vote of thanks to the Council.

S. M. HANSON, Hon. Secretary.

SECRETARY'S REPORT, 1949

Compared with 1948, 1949 forms an important contrast, first because *Bulletins* and Exchange Sheets have been sent to members promptly and second, because there has been a big change in the proportion of junior and senior members.

During the earlier part of 1948 one in three were junior members but in late 1949, only one in six. This is causing concern to the AES Council because one of the chief aims of the founder of the Society, Mr Tesch, to assist the interest of the younger people in their hobby, is not being achieved. With this important fact in mind, Mr Lewis has prepared a new prospectus in the form of a wall chart, giving details of the various Insect Orders. This will be sent to a large number of schools etc., and it is hoped will attract a number of junior members.

During the closing days of December, the *First Supplement* to the *Directory of Natural History Societies* was published: our thanks must be recorded to Mr Airy Shaw for his work on this useful publication. Before leaving the subject of publications, special mention must be made of the *Bulletin* Index for the years 1946-1948, and the one for 1949, which were compiled by Mr Trought.

The A.G.M. and Annual Exhibition were held in March, but although a large number of people attended, few brought exhibits. The interest of members was, however, held by Messrs Last, Parmenter and Syms, with their excellent lectures.

Before closing this Annual Report I must take this opportunity of thanking, once again, all those who assist in the running of the Society, for without them the AES would not function.

S. M. HANSON, Hon. Secretary.

REPORT OF HON. TREASURER FOR YEAR ENDED 31st DECEMBER 1949

The Treasurer did not propose to elaborate on the Society's Financial Accounts, details of which would be published in due course. The financial position of the Society at the end of 1949 was sound but not as flourishing as might be supposed from a casual inspection of the actual ac-

counts. The balance remaining in the Income and Expenditure Account totalled £750 6s 10d, of which £559 15s 8d was represented by cash at the Bank.

It was estimated that to produce *Journals* for the years 1947 and 1948 would absorb somewhere in the region of £400, thus leaving only approximately £150 liquid cash, which the Treasurer considered was the minimum upon which the Society should be expected to run. The remaining £200 balance on the Income and Expenditure Account was covered by the stock of publications, etc., which, of course, could only be converted into liquid resources as and when sold.

The year's activities of the Society resulted in a surplus for 1949 of £110 7s 1d, the whole of which was brought about by the profit resulting from the sales of publications.

The subscriptions due and received during the year were wholly spent in the production of the regular monthly *Bulletin*, the necessary expenses of despatching the *Bulletin* and the general running of the Society.

A comparison of the excess of income over expenditure between 1949 and 1948 shewed a considerable drop, and this was largely brought about by the fact that *Bulletins* were now more regular and larger in size.

The point had now arrived when any further improvement in the *Bulletin* would depend solely upon an increase in membership.

The rules of the Society provide that members who do not pay their subscriptions by the end of March may be removed from membership, but during the year 1949 it was not found possible to enforce this rule and in consequence a considerable number of members who failed to renew their subscription actually received *Bulletins* until September. This, of course, involved the Society

in expenditure which was never covered by any income. This matter had been remedied for the year 1950, and in future it was hoped that such unnecessary expenditure would be completely stopped.

CORRESPONDENCE

9 St Alban's Grove,
Kensington, W.8,
1st April 1950.

The Editor,
The Amateur Entomologists' Society.

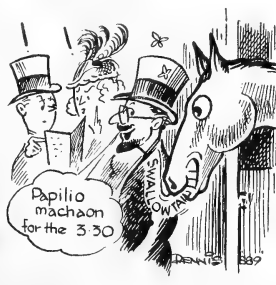
Dear Sir,

All my friends connected with Fleet Street assure me that the daily newspapers of this country sustain their circulation by ensuring that they have racing correspondents whose tips are better than those given by all other newspapers. Might I suggest, Sir, that this simple yet efficacious fact be utilised by our Society?

I would like to propose a system which just cannot fail.

Anybody with half an eye who takes no particular interest in horse-racing should have observed that last year, 1949, was a "dead cert" for anyone with even the slightest entomological leanings. Swallow Tail came third in the Derby at 100-8, a profitable each-way bet. There are other entomological horses which run, and win, to mention but White Ant, Moth, and Fly's Eye. 1950 opened with a victory for Heather Beetle, at excellent odds.

I propose, therefore, that the Society institutes a "Racing Intelligence Service" to its members, informing them when an "entomological horse" is to run. Members pay into a Fund the odds to two shillings. The Society acquires thereby a large profit in a short space of time, and it must be remembered that this is not taxed by the Chancellor. This



in turn means that the Society has a Reserve Capital which can be used to support members who have gone broke by following the aforementioned horse-racing system.

I hasten to add, Sir, that I am prepared to waive any commission due to me for this invention, as a demonstration of my attachment to the cause of entomology (and racing).

I beg to remain—as I think the racing fraternity expresses it—yours in Sport,

A. N. BRANGHAM (18).

THE HEATH FRITILLARY— *MELITAEA ATHALIA*

To Mr Le Masurier's note (*Bull. No. 112*, p. 39) on *M. athalia* in Kent and Essex, I can add a note on the re-introduced Sussex colony.

On June 27th, 1948, the butterflies were out in good numbers, the females fresh, the males mostly somewhat worn, on the heathy border at the south side of the wood. The area was about 700 yds. long by 200 yds. wide, or about 3 acres. The butterfly was also found a little way into the wood in a few spots. Cow-wheat (*Melampyrum pratense*) was abundant.

The specimens taken were not so variable as those I have taken in Kent, but of about the same hue as an average Kentish specimen.

One colony only was found in the wood; time would not permit a thorough search, but having come right through the wood to find this colony, I think it was probably the only one; it is therefore still best left alone, and Kent specimens obtained in preference.

A. J. SHOWLER (1442).

FIELD COLLECTING TIP

Referring to the article by C. R. Haxby (1508) in *Bulletin No. 111*, p. 22, the best thing, undoubtedly, for butterflies is to bring them back alive, in glass-topped cardboard boxes. The advantages are:—(1) if kept cool they do not get damaged; (2) females can be selected for breeding; (3) it prevents the necessity of killing damaged and surplus specimens, the latter being released as desired. How often has one met collectors with a jar containing chiefly rubbed specimens, or females that should have been retained for breeding, etc., etc.

J. H. PAYNE (353).

A LEPIDOPTERIST'S LAMENT

For twenty-five years have I collected and studied Butterflies and Moths. For fifteen years I was happy—I knew them by their English names. Why bother about Latin—a dead language and a pain-in-the-neck at school? If a new species came my way I could place it in a minute; I knew them all, I knew my books so well.

But now I know nothing!

Ten years ago I sought to master the Latin specific names in order better to understand more technical books and articles. This was hard enough, but in part I succeeded. Now many changes have been made—*menthastris* has become *lubricipeda*, *lubricipeda* is *lutea*, but *lutea* is still the Pink-barred Sallow, though it is suggested it shall be called the Red-headed Orange. Then to make confusion worse confounded a book on larvae is published with an index in alphabetical order of generic names, and NOW you, Mr Editor, you have been guilty of the same offence! Am I to learn more names that will fade or change in the night? No, Sir, this is the end; I shall collect matchbox tops, these at least have their names indelibly and irrevocably written on their faces!

JOHN E. KNIGHT (94).

[*Editorial Note:—The Editor would gladly reduce the Index of Macrolepidoptera to English names only. Would members like that or will a member volunteer to undertake the specific name index? He is full of regrets that he has driven Mr Knight to collecting matchbox tops, but promises to publish an article by Mr Knight on their classification if he will write one.*]

Flash-back — “Entomological nomenclature is like the sand at the seaside, shifting at every tide.”—Ambrose Quail in *The Entomologist*, Vol. 33, No. 440, p. 6 (January 1900).

THE CLOUDED YELLOW

Being unable to get a pairing of *Colias croceus* (Clouded Yellow) from an emergence in early October 1949, a number of marked males and females were released in a large lucerne field near Wellingborough.

The following table gives the results:—

Males and females released for pairing—October 9th, 1949.

Two marked females taken—October 16th, 1949.

Ova deposited—October 19th-22nd, 1949.

Ova hatching in a sunny warm room—November 1st, 1949. Feeding up in a warm room on a growing plant of either *Trifolium striatum* L. or *Trifolium subterraneum* L.

First larva hanging up for pupation—January 9th, 1950.

First pupa formed—evening of January 11th, 1950.

9 pupae formed (total number)—January 28th, 1950.

1 female emerged (forced)—February 20th, 1950.

1 male emerged (forced)—February 23rd, 1950.

1 female emerged—February 24th, 1950.

1 female emerged—February 25th, 1950.

1 male emerged crippled (loose pupa)—March 3rd, 1950.

About forty ova were deposited, but about half did not hatch. All the imagines are slightly below average size and of a much more rounded shape than type.

All pupae began to show colour on the 18th February and were placed in a cardboard container, with a 75 watt bulb for forcing. This kept the temperature at a steady 80° F. The bulb was lighted each evening for about four hours.

J. H. PAYNE (353).

COLLECTING IN THE ARMY

I have just completed my period of two years' National Service in the Army and would like to mention some of my experiences with Lepidoptera while I was in khaki.

First, let me say to those who have yet to do their National Service that there is no need to give up all hope of collecting while in the Services. It just needs a little careful planning of the available time you have and a little forbearance if your plans for a week-end's hunting are upset by the R.S.M.

I was never sent abroad during my service and so had often good chances of collecting. During 1949 I have added at least 25 new species to my collection. It was not until the Spring of 1949, when I was posted to Maresfield Camp, near

Uckfield, Sussex, that I realised I could collect satisfactorily. When April came, I brought from home my net, killing bottle, boxes and a relaxing tin. The latter was most important, as I had to do all my setting whenever I could get home for a week-end. The area of the camp must have once been wooded and several wood and species were to be seen although some way from their normal surroundings. Butterflies were fairly prolific, the Meadow Brown (*M. jurtina*), Hedge Brown (*M. tithonus*), and Wall (*P. megera*) being common all over the camp. The Speckled Wood (*P. aegeria*) was also to be seen occasionally, fluttering around the huts. Of the smaller species those most often noticed were the Common Blue (*P. icarus*), Grizzled Skipper (*S. malvae*), Small Skipper (*A. sylvestris*), and large Skipper (*O. venata*). I did not collect any butterflies in the camp for obvious reasons, but I would like to have taken a specimen of the Pale Clouded Yellow (*C. hyale*) which flew past me one day when on parade! The larvae of the Large White and Small White swarmed on the nasturtiums, which are inevitably planted outside offices and huts in all army camps!

The moths I took were nearly all caught at light. Many lights were left on all night and these provided many species at rest nearby in the morning. In this way I took a male Lobster (*S. fagi*) and a male Lappet (*G. quercifolia*). The only Hawk Moth noted was a Privet Hawk on July 4th at rest on the upright of a door above which a light had burned all night. The best Geometer taken at light was a male *B. roboraria* (Great Oak Beauty) in good condition. All these specimens and many others were boxed, killed and stored in my relaxing tin until I could set them.

During April and May the camp swarmed with the Cinnabar (*C. jacobaeae*). I examined many specimens and obtained one or two good examples. In late May and June I was able to watch some of the habits of the Ghost Moth (*H. humuli*). Both sexes were to be seen over the grasses at dusk. After the first nuptial flight was over the pairs could be seen *in cop.* on the grass stems. Later in the month, the males became less active and the females could be seen flying over the grass, presumably depositing eggs at random.

I was not able to keep larvae, as there are limitations of available space. However, I did keep some eggs of the Pine Hawk (*H. pinastri*) from a New Forest female. When these hatched I took them home to be cared for by my family.

Apart from collecting in camp, I was also able to visit several places around the district. One week-end I spent in Ashdown Forest, where I took a fine series of the Grey Birch (*E. punctulata*).

I think this short account will show that it is by no means impossible to collect satisfactorily when in the Services. J. H. PLATTS (515).

SPRINGING, DROOPING AND CURLING

The problems mentioned by Mr Weightman (1485) and Commander Harper (1169) on page 95 of the December number of the *Bulletin* have at one time or another affected most of us. I have suffered a great deal from all of them, particularly as most of my collecting has been done in India in an area of exceedingly heavy rainfall (between 100 and 200 inches per annum) and very high temperatures (summer average over 90°).

Springing is due, in my experience, entirely to the specimen being too dry when the setting is done. I have never had it happen if a specimen is fresh and properly relaxed when set. The reason would appear to be that the muscles of the wings have begun to dry and contract before the insect is set and it is usually most noticeable in insects which have died with their wings folded upwards over the back, in which position *rigor mortis* has set in. Where the muscles have begun to dry and contract in this position, the wings are pulled down against the pull of the contracting or drying muscles. If this drying has not advanced very far the wings seem to be set perfectly well when the insect is first removed from the setting board, but after a time the contracting is resumed and the wings spring gradually. But where the drying and contracting has proceeded further before the setting is done, the contraction commences again very soon after removal from the board and the insect may spring very soon. It is sometimes difficult to tell when the drying and contracting of the muscles has proceeded too far

at the time of setting—the insect may set easily and yet spring after removal from the board. It must be remembered that the wing muscles of a butterfly or moth are very powerful and, if allowed to contract in a certain position, will pull the wings towards that position again, if they are moved after death.

The solution is that it is essential to set the specimen when it is as fresh and as relaxed as possible. The antennae give a very clear indication as to whether the drying and contracting process has proceeded too far. If they are easily moved with the setting needle and do not curl but remain in any position in which they are placed, it indicates that springing is unlikely.

(To be continued)

R. E. PARSONS (1512).

THE RINGLET, *Aphantopus hyperantus*, Linn. — A CORRECTION

With reference to Mr S. G. Castle Russell's interesting article in the April *Bulletin* (No. 112), pages 33 and 34, there was some misunderstanding regarding the latter portion of the second paragraph on page 34.

From time to time Mr Russell supplied me with particulars of his forms of *hyperantus* and I endeavoured to incorporate them in a manuscript. This, however, may not be entirely satisfactory as the spottings are very complex and I have not been able personally to examine his unrivalled collection of this species, and so far as *hyperantus* is concerned there has been no correspondence between myself and the South London Entomological Society.

The manuscript which I presented to that Society embraced the "British Aberrations of the Gatekeeper, *Maniola tithonus* Linn.: Meadow Brown, *Maniola jurtina* Linn.: and Small Heath, *Coenonympha pamphilus* Linn." This, together with 3 plates of 46 coloured figures, has recently been published by the South London Society in their 1948-49 *Proceedings and Transactions*, obtainable from Mr E. E. Syms (406), F.R.E.S., 22 Woodlands Avenue, Wanstead, London, E.11: price, twenty-five shillings, post free. It contains other plates and matter. Originally I hoped to include all four species, but *hyperantus* had to be omitted and Mr Russell was not aware of this when writing his article. H. A. LEEDS (282).

NOTES AND OBSERVATIONS

KENNETH WARD (1680) writes:—One day in 1948 I was given a caterpillar of the Privet Hawk-moth (*Sphinx ligustri*). It was found upon Holly.

When I was given the caterpillar it was about half-grown. I continued to feed it on holly and in due course it went to earth.

In May 1949 I heard something in the box, and, on looking in, I saw a Privet Hawk-moth—wings still crumpled—near the empty pupa.

In a few minutes I looked at the moth again. Its wings were properly expanded and I noticed that it was much larger than any other Privet Hawk I have ever bred.

Is it unusual to find a caterpillar of this species feeding on Holly? I wonder if any other members have had this experience.

I have had a similar experience to Mr L. S. Beaufoy (628) in the February *Bulletin* (Vol. 9, No. 106, p. 16). I had a pupa of the Privet Hawk-moth which stayed as a pupa for two winters (1947-48 and 1948-49).

(In *Larval Foodplants*, by P. B. M. Allan, *Holly* is given as one of the numerous food-plants of the *Privet Hawk*.—Ed.)

OBITUARY

It is with great regret that I notify the passing of Mr W. E. Dale of Bexley on January 22nd, 1950. Mr Dale was an enthusiastic collector of Lepidoptera and, with the aid of his son, Leslie, had built up a fine collection containing most of the British species of butterflies and many hundreds of moths.

Possibly his greatest achievement was the successful breeding of *Endromis versicolor* var. *lapponica* (a melanic form) over a number of successive years. I understand he was the first entomologist in this country to breed this variety, though it was not entirely unknown, as a German collector bred one from Swedish type stock some eighty years previously. Three of Mr Dale's specimens were presented to the Keeper of Entomology, Natural History Museum, for the National Collection.

Mr Dale will be remembered as a very early member of the Society and I feel sure all members will join me

in offering their sympathy to his widow.

D. E. NEWMAN (65).

REVIEWS

Entomologists' Gazette (Quarterly). Vol. 1, No. 1, January 1950; pp. 51. Illustrated. Published by Watkins & Doncaster; 20/- per annum or 6/- per issue. Edited by E. W. Classey, F.R.E.S., and R. L. E. Ford, F.R.E.S., F.Z.S., assisted by six well-known entomologists.

This new venture of the Publishers has certainly started off in a noteworthy manner. The first point which struck me is (apart from essential advertisements) the total absence of any references to the publishing house—the contents being pure entomology from cover to cover.

The second point of note is the promise that this magazine will be confined to *British Entomology*, apart from references to Palearctic species, where they have direct reference to British insects. This is a very important argument in its favour, for no other commercial periodical is published solely for British insects.

Each issue will be complete in itself, as the plan is, by making the publication quarterly, to avoid serialisation of articles.

The size is 8¼" × 5½" and the printing is in facsimile typescript, perhaps not quite so kind to the eyes as ordinary print, but nevertheless clear and permanent. This method of printing considerably reduces cost on this score and allows more pages per issue.

Now for a word of criticism. There are two bad faults in this first issue:

1. Very inferior stapling. Several pages are loose in the review copy.
2. Fourteen or fifteen spelling errors. These are probably typographical, but nevertheless reflect on the editors. These points must be rectified, as they irritate subscribers.

As circulation grows, the publishers promise to increase the number of pages per issue. When this is possible, it would be as well to reconsider the style of printing. It is to be hoped, however, the format will not be altered, as these magazines will no doubt be bound up by many subscribers, as being of permanent entomological value.

I have no hesitation in bringing this excellent magazine to the notice of our members, and from my personal knowledge of the editors am

confident the theme of its future contents will be—Entomology for Entomology's sake.

H. E. H.

WARE CANNIBALS

Some time ago I was asked to compile a list of larvae known to be cannibals.

I do not, in the following list, give those species which are only accused on very slight grounds, but only name those species which I have definitely proved to be guilty; or which, on the authority of several eminent entomologists, I feel justified in adding to the list.

From time to time, several of the Hawk Moths, particularly *Smerinthus ocellata* L. (Eyed Hawk Moth), *Laotroë populi* L. (Poplar Hawk Moth) and *Cerura vinula* L. (Puss Moth) have been accused of cannibalism. The Hawk Moths do, on occasion, nibble each other's 'tails'; this only happens, however, when they are overcrowded and two or more get on one twig. When this happens, the victim invariably dies, or fails to pupate. I have yet to see *vinula* devouring another larva.

Amongst the butterflies there are very few outright cannibals. The classic example of *Maculinea arion* L. (Large Blue) devouring the larvae of ants is a form of partial cannibalism, for this only occurs in the final stadium. The larva in its young stadia is, however, cannibalistic to some degree and if bred in captivity should be separated from temptation.

Celastrina argiolus L. (Holly Blue), *Callophrys rubi* L. (Green Hairstreak) *Anthocharis cardamines* L. (Orange Tip) are definitely cannibals, although they do not hunt their prey. It only seems to occur when the larvae meet accidentally and then it is a case of "Devil take the foremost."

Among the moths there are two very outstanding examples of larvae with this distressing habit. The worst of all, in my opinion, is *Eupsilia transversa* Hufn. (The Satellite). This "Tiger of the Twigs" deliberately hunts his prey and when doing so can move at an extraordinary speed. He literally leaps on his victim and begins to bite into it immediately on contact. In a very few moments nothing remains but an empty skin. It is astonishing the havoc one Satellite can cause in a collecting tin or cage, in the space of a short hour or so. If handled this larva will even attack the collector's hand, but cannot, of course, pierce the skin.

A very close second to the Satellite is *Cosmia trapezina* L. (The Dun-Bar), another of the hunters—in fact, for sheer horror, there is little to choose between them. P. B. M. Allan, in his book, *Larval Foodplants*, states:—"In confinement, they will eat cold cooked mutton."

Other larvae I have definitely proved to be cannibals are:—

Drepana binaria Hufn. (Oak Hook-Tip)—at least in the two final stadia.

Asphalia diluta Schiff. (Lesser Lutestring).

Brachyonycha sphinx Hufn. (Sprawler).

Lithosia quadra L. (Four-Spotted Footman).

Campaea margaritata L. (Light Emerald).

Cosmia pyralina Schiff. (Lunar Spotted Pinion).

Newman and Leeds state *C. pyralina* is not a cannibal. I must, however, differ, as I actually saw one devour his brother (or sister) in 1949. They also exonerate the other members of the genus *Cosmia*. In view of the above, I shall, personally, view all the members of the genus with grave suspicion. One would also be inclined to be suspicious over all the Blues and Hairstreaks. Many of the Blues are known to have associations with ants and as the Green Hairstreak is definitely a cannibal and the White Letter Hairstreak simply gorges itself on soft pupae, the integrity of the Hairstreaks must be doubted.

If overcrowded, or kept on short commons, the following species have no hesitation in turning carnivorous:—

Graptolitha ornitopus Hufn. (Grey Shoulder Knot).

Lithophane socia Hufn. (Pale Pinion).

Cirrhia icteritia Schiff. (Sallow).

Messrs Newman and Leeds state that possibly *Dicycla oo* L. (Heart Moth) is cannibal. The late J. H. Grant reared this species from the egg and assured me it was cannibal. I cannot speak from experience.

There have been several enquiries regarding the status of *Colotois pennaria* L. (Feathered Thorn). I bred a small batch of fifteen in 1948 and after these had unaccountably dwindled to eight, I watched them carefully. Nothing happened during daylight, but after several attempts to catch them at night, I eventually saw one being eaten by the sole survivor. I can state, therefore, with all assurance, that this species is a cannibal. I have never had cause to suspect any other Thorn species.

There is no doubt whatever, that many species have lurking tendencies towards cannibalism, as so many of them are addicted to eating the soft pupae of their own and other species. This often happens with the *Arctiidae*, and in particular, *A. caja* L. (Garden Tiger) and *Spilosoma lutea* Hufn. (Buff Ermine). These two species will do much damage in this way, even if plentifully supplied with fresh food. The only solution is to keep them in small batches to avoid close contact.

S. E. W. Carlier informs me that he had a lot of trouble with *Phrosia tremula* Cl. (Swallow Prominent). Whilst above-ground no suspicion of cannibalism arose. He happened to see a larva which was about to go down, attack and kill another which was half-buried. On investigation he found that 17 out of 20 larvae, which were about to pupate and were completely buried, had been bitten and sucked by the survivors. These were confined to a 7 in. flowerpot. This episode may be a partial answer to the problem of damaged and deformed pupae so often found when removing them from the pupating medium. It also emphasizes the dangers of overcrowding. The principle of avoiding overcrowding should be applied to all larvae reared in cages, not only to eliminate lurking cannibalistic tendencies, but also to ensure healthy broods. Liberties taken by crowding larvae into inadequate containers seldom result in good-sized imagines and the mortality among the larvae from fungous and virus diseases can ruin a year's work in a matter of days.

H. E. HAMMOND (423).

MITES ON INSECTS

Summary to date—

K. H. BOBE (912) made the first record in the *Bulletin* (No. 87, July-Sept. 1947, p. 126) of mites on butterflies, by drawing attention to a small red parasite he had noticed on the Small Tortoiseshell (*Aglais urticae*), the infestation on one specimen being sufficiently heavy to prevent flight. P. J. BROMLEY (1077), R. G. HELEY (731) and G. C. HOLROYD (253) in *Bulletin* 88 (Oct.-Dec. 1947), p. 130, carried the question a little further. The mite seemed to be a larval form of *Belaustium* and was found also on the Meadow Brown (*Maniola jurtina*), the Ringlet (*Aphantopus hyperantus*) and other unnamed butterflies; though G. C. HOLROYD had not noticed one incapable of flight because of the infestation. The chalk formations were the favoured habitats. In *Bulletin* 89 (Jan. 1948), p. 149, P. J. GENT (192) added to the list of hosts, also from chalky soil, the Common Blue (*Polyommatus icarus*), Chalk-Hill Blue (*Lysandra coridon*) and Adonis Blue (*L. bellargus*).

In *Bulletin* 93 (Aug.-Sept.), p. 212, G. C. HOLROYD, as a result of research, suggested that the mite was the larva of *Belaustium nemorum*, which was found on the Crane Fly. A. P. MAJOR (1117), in *Bulletin* 99 (Mar. 1949), p. 14, gives more information about mites found in his breeding cage and attacking newly-emerged Small Tortoiseshells. Dr J. E. HULL and Prof. J. W. HESLOP HARRISON, through Dr A. A. D. LA TOUCHE (884), our Adviser on Spiders, expressed opinions, querying the term 'red'; though Prof. Harrison had seen brownish mites on dead lepidopterous pupae. These he had set down as immature Gamasids. K. A. SPENCER (1563) in the same *Bulletin* extended the list of hosts to the Marbled White (*Melanargia galathea*), and to the Scotch Argus (*Erebia aethiops*) in Switzerland. He had noticed that the mites apparently merely cling to the butterfly's body. S. DEXTER (847) in *Bulletin* 104 (Aug. 1949), p. 58, confirmed K. A. Spencer's observation and said the mites in question were a "very bright red colour" and could not be regarded as brown. P. G. TAYLOR

(719) confirmed this in *Bulletin 105* (Sept. 1949), p. 69, and A. P. MAJOR, H. K. AIRY SHAW (545) now brought in beetles as hosts,—whitish-brown mites on *Melolontha* and a *Sinodendron cylindricum* beetle, and species of *Geotrupes* and *Aphodius*. Mr E. BROWNING of the B.M. (N.H.) wrote that mites used insects as a means of transportation. C. DOWN (59) recalled bright red parasites attached to *L. coridon* (The Chalk-Hill Blue) caught on Royston Heath in the early 1920's. Some were so covered that their flight was impeded or they were found on the ground exhausted.

Further notes from members follow:

A. P. MAJOR on August 11th, 1949, saw a Dor Beetle (*Geotrupes stercorarius*) flying round and round in a circle, in his garden. After a while it dropped to the ground, rested, and then started off again on its erratic flight. When captured its body was found to be almost completely covered with whitish-brown mites, which also clung to its legs. In a field near Rainham, on August 13th, 1949, he came upon a circle of grass that had been cut down and laid flat carefully, like the foliage around the entrance to a Wasp's nest. In the centre of this was what appeared to be a pile of lawn trimmings. This was a nest of Knapweed Carder Bees (*Bombus agrorum*). When the nest was revisited on September 4th, all the bees were dead, and the bodies of those examined gave no clues as to what caused their death. Alongside some were the puparia of a fly. The cells were empty and rotten and were swarming with a red-brown mite, which was very agile. It was presumed that this mite was a scavenger.

J. GREEN (1044) found *Sinodendron cylindricum* bearing whitish-brown mites; there were three under the elytra amongst the folded wings. Another beetle found with mites was *Melandrya caraboides*, which bore them on the head and legs. *Necrophorus humator* and *N. vespillo* (bearing 32) as well as some of the *Hister* species have been found with mites similar to those found on *Geotrupes*.

An interesting query arises out of the finding of a small brown mite in the midgut of *Cylindronotus laevioctostriatus*. This beetle is believed to feed on the green alga growing on trees (*Pleurococcus* or *Protococcus*)—was the mite a parasite or was it ingested accidentally?

Mr P. S. BROMLEY gives a reference to a note he published in the *Entomologist's Monthly Magazine* of 1947 (p. 58), giving the identification of the mite on a male *Maniola jurtina* as a larval *Belastium quisquiliarum* Herm. Dr TURK said not much work had been done on that family. He observed that in one case a mite was moulting *in situ* on the butterfly. The host was caught on the chalk hills above Watlington, Oxon.

TERENCE PARSONS (1513) writes:—"With reference to Mr C. Down's note on the occurrence of mites on the Chalk-Hill Blue Butterfly (*L. coridon*), in *Bulletin 105*, p. 69, I may say that I have read, some time ago, in the *Entomologist* for 1924, of the finding of pinkish or vermilion coloured mites on the bodies of certain moths.

"Reading through the steadily increasing number of notes on this interesting subject in our *Bulletins*, it seems to me that these mites, whatever they may be, are not very uncommon, though probably often overlooked, or else ignored. They appear to be most frequently encountered on butterflies of the family *Satyridae*, and in particular on *Melanargia galathea*.

"My own experience of them is limited. On the afternoon of August 5th, 1949, I netted a couple of fresh *Maniola tithonus* females from a bramble thicket in Cwm Dimbath, Glam. While pinning these specimens at home the same evening I noticed a number of bright red mites on the bodies of both insects. The specimens had been in my killing bottle with ethyl acetate, so that the mites, though still clinging to the bodies of the butterflies, were quite dead. I removed thirteen of them from one insect, and eleven from the other, all from between the dorsal surfaces of the thoracic and abdominal sclerites, with the aid of a pin. I then proceeded to set the specimens, but retained the mites for examination later, by means of a hand-lens, though it was not possible to make out much detail, as they had contracted unnaturally in dying. Each mite was of a definite bright red, almost the colour of a Ladybird Beetle (*Coccinella*), and they varied from about half-a-millimetre to one millimetre in diameter. The butterflies are now off the setting boards, and to date (Sept. 2nd) they do not appear to have suffered any damage, so it appears that no mites had burrowed into the bodies.

"It may also be of interest to record that I have rarely found specimens of *Geotrupes spiniger*, *sylvatica*, *typhoeus*, or *stercorarius*, free from flesh-coloured mites on the undersurface of the body (and we must not forget that often the countryman's name for the latter species is 'Lousy Watchman'). I would like to point out, however, that these mites do not appear to be like those with which some Lepidoptera are infested. They are larger, with longer legs, and are much more active, crawling about all over the beetles' underparts, and they are not parasites, because it is a well-known fact, as Mr H. K. Airy Shaw mentions in *Bulletin 105*, p. 69, that they act as 'scavengers' by cleansing the legs, and body of the dung-beetles. I have occasionally seen similar mites on species of *Silpha*, *Necrophorus*, and some other Lamellicorns.

"I have also very frequently found active mites crawling all over the fur of the large Humble Bees (*Bombus lapidarius*, *terrestris* and *lucorum* in my own experience). These mites again are unlike those noted on Lepidoptera, but they closely resemble those infesting *Geotrupes* spp., except that they are more of a yellowish colour. I think these are fairly well-known and doubtless some of our Hymenopterists will be familiar with them. Though I have taken no note of them, I have seen the mites occurring on the Coleoptera, and the Hymenoptera, named in several books."

V. C. P. ALMY (1887) has made the following notes on the topic of mites on Lepidoptera:—

Corfe Castle—July 1947, Marbled White (*M. galathea*) and Chalk-Hill Blue (*L. coridon*) heavily infested with red mite. *Lulworth Skipper* (*T. actaeon*)—one or two specimens had single mites on thorax. No specimens showing signs of weakness as the result.

Portland—July and Sept. 1947, Marbled Whites heavily infested.

Plympton—June 1948, Small Pearl-Bordered Fritillaries with one or two mites attached. July 1948, most Meadow Browns heavily infested with red mites.

Plymstock—June 1949, Marbled Minors (*P. strigilis*). July 1949, Common Rustic (*A. secalis*) heavily attacked with red mites. July 1949, Common Blue (*P. icarus*), Green-Veined White (*P. napi*) and one specimen of Brown Argus (*A. agestis*) with mites on them. Also Brown-Line Bright-Eye (*L. conigera*), Smoky Wainscot (*L. impura*), Campion (*H. cucubali*)

Savernake—August 1949, Small Heath (*C. pamphilus*), many specimens affected.

Plympton—Sept. 1949, on a Feathered Gothic shown me by Mr R. Haynes, a fellow AES member, there were 233 of these red mites on the antennae only. There was not one on the body.

W. J. MEAD (1878) says:—I have read with interest the notes on Mites on Butterflies. My experience of these mites has been connected with *L. bellargus* and *P. icarus* found in the Chilterns. On 29.8.48, I caught several *L. bellargus*, and on examination found that in each case the thorax was covered with bright red mites. I took several other species at the same spot, but these were unaffected. Although I frequently collected in the same locality in the 1949 season, I did not find any evidence of mites until July 31, when I caught a single *P. icarus*, with four brown mites upon it. These were larger than those found on *L. bellargus*. Can it be that the bright red and brown mites referred to in other articles are of two different species?

B. R. STALLWOOD (1847) comments:—"The 1871 volume of *Hardwicke's Science Gossip* reveals two observations of these parasites. J. Anderson Jr., of Arlesford, Hants., referred to scarlet mites found on *Agapetes galathea* and suggested they might be *Acarus autumnalis*, the 'Harvest Bob', while T. W. Wonfor of Brighton found similar mites on *Eumenis semele*, *Pararge megera*, *Coenonympha pamphilus*, *Agapetes galathea*, *Lysandra coridon*, *L. bellargus*, *Vanessa atalanta*, *Aglais urticae*, and several moths including *Plusia gamma*. He suggested they might be *Tetranychus lapidis*, the 'Stone Mite.' Both of these observers emphasised that the parasites were bright red. My own experience was finding *Eumenis semele* heavily infested at Boxhill, Surrey, in 1946. the butterflies being so lethargic that they could be taken by hand. Up to forty scarlet mites were observed on one Grayling, mainly round the neck and thorax. I wrote to Mr N. D. Riley of the British Museum (Nat. History), who kindly replied that these parasites were well known, particularly on *Maniola jurtina*; they were difficult to name specifically, but were larval forms of a species of mite belonging to the family *Erythraeidae*."

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for the year ended 31st December 1948

RECEIPTS		PAYMENTS	
To Cash at Bank, 1.1.48	£326 19 11	By Publications	£544 7 8
.. Subscriptions, 1947	£16 12 6	.. Postages	68 9 4
.. Subscriptions, 1948	297 7 6	.. Stationery	41 4 11
.. Subscriptions, 1949-50	14 15 0	.. Advertising	14 6 8
	328 15 0	.. Subscriptions	0 15 0
.. Donations	46 3 8	.. Meetings	3 11 6
.. Grant from Royal Society	100 0 0	.. Mytins	2 14 0
.. Publications Sales	186 11 5	.. Sundries	0 7 4
.. Data Labels	34 4 3	.. Cash at Bank, 31.12.48	392 12 7
.. Advertisements	33 15 3		
.. Stationery	4 6 9		
.. Mytins	5 7 2		
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.. Creditor	1 10 0		
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.. Stock, 1.1.48 £305 0 7		.. Donations	46 3 8
.. Purchases 444 7 8		.. Advertisements	33 15 8
	£749 8 3	.. Sales of Mytins	£5 7 2
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	666 7 2		
	£83 1 1		
.. Stationery:			
.. Stock, 1.1.48 £27 11 0			
.. Purchases 48 1 5			
	£75 12 5		
.. Less Sales £38 11 0			
.. Stock, 31.12.48 15 6 0			
	53 17 0		
	21 15 5		
.. Postages and Sundries	83 18 9		
.. Meetings	3 11 6		
.. Outward Subscriptions	0 15 0		
.. Advertising	14 6 8		
.. Balance excess Income over Ex-			
.. penditure	227 1 2		
	£434 9 7		£434 9 7

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31st December 1948

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.. T. Buncle & Co. Ltd. ...	£100 0 0	Sundry Debtors	0 13 0
.. V. Siviter Smith & Co.		Subscriptions overdue	40 5 0
.. Ltd.	50 0 0	Stock valued at Cost:	
.. R. F. Pauly	1 10 0	.. Publications	£479 15 9
	£151 10 0	.. Stationery	15 6 0
Officers' Expenses accrued	15 7 7		495 1 9
Subscriptions paid in advance	21 15 0		
Grant from Royal Society	100 0 0		
General Income and			
Expenditure Account:			
.. Balance brought for-			
.. ward from 1947	£412 18 7		
Excess Income over EX-			
.. penditure, 1948	227 1 2		
	639 19 9		
	£928 12 4		£928 12 4

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LECTURES will be given, as follows, by Mr E. E. SYMS (406) F.R.E.S., "A Study of Living Insects," and Mr G. B. COLLINS (1036) "Orthoptera."

The hall opens for receipt of exhibits from 10 a.m. onwards, and the meeting is declared open at 2 p.m.

Exhibits must be cleared from the hall by 6 p.m.

There should be excellent opportunities this year for members and their friends to bring living exhibits, photos, drawings, etc.

Do please label clearly.

Anyone requiring an extra large amount of space for their exhibits should notify the Meetings Secretary beforehand; offers of help and enquiries should also be sent to:

D. P. GOLDING (Meetings Secretary), 517 Foote Cray Road,
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Please tell your friends about this Exhibition.

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No. 115

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EDITED by TREVOR TROUGHT, M.A., F.R.E.S.

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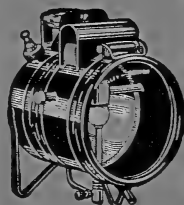
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No. 115

BULLETIN

JULY 1950

NOMENCLATURE

Mr R. H. Benson's trouble with regard to nomenclature has arisen because "the best laid schemes of mice and men gang aft agley." Many years ago some common-sense zoologists realised that many species had received different names from different authors and that confusion resulted. Some rules were therefore formulated, and as it became obvious that each species should be known by every zoologist by one name, an international committee on zoological nomenclature was formed. It is unfortunate that zoologists and botanists did not come together over these rules as botanical ideas of nomenclature are somewhat different.

However, all would have been well for our nomenclature but for two things:—One that our zoological law-makers used such legal jargon that a number of rules have required interpretation, which has resulted in the publication of numerous "opinions," and the other that many even less qualified amateurs have realised that a new game has been put before them and have stretched the rules to cover more than common sense requires.

For instance, one fundamental rule is that the correct name of a species is that by which it was first known, and, at the time this rule of priority was laid down, it cleared up much confusion. But these amateurs discovered that there were a number of names in older literature which had been used, or had long ceased to be used and to these they applied the rule of priority. Once more confusion became worse; yet all that is necessary to scotch these interferences is to insert a clause in the rule that "*henceforth no change of a well-known name of a genus or species will be accepted if it is made solely by reason of the discovery of an earlier name.*"

Another common-sense rule laid down was that no two species in a genus must be known by the same name. This rule obviously means that if, in any genus, there is a species named, say, "alpha," no new

species added to that genus can be given that name; and, similarly, if it becomes necessary to unite two genera so that two species with the name "alpha" come together, then one of these, the one more recently named, must have a new name. But our amateurs interpreted the rule literally and said, if at any time in the past, two species with the same name have been in one genus, although they have not been so placed for many years, yet the name of the "younger" so-named species must be changed—an interpretation of the rule which is of no value but which adds confusion to nomenclature.

My advice to Mr Benson is to decide for himself which name he wants to use, but always to mention whose nomenclature he is following.

FRANK BALFOUR-BROWNE (340).

REARING THE PURPLE EMPEROR IN THE NORTH

Some of our members in the North may wish to rear this fine insect.

The method Mr Holroyd described in the *March Bulletin*, No. 111, p. 24, would be quite useless as far north as Lancaster.

I found as he did that the larva would not live through the winter on cut wood, even if kept in water, so I had to think of some other method.

I put some cuttings in the garden from a large willow tree (*Salix caprea*). In two years' time these made nice trees.

During the second winter, before the sap was up, I planted one in a large box and cut the longest branches back a little.

By the time I got the ova it had made a nice tree full of leaf.

I cut fairly close round an ovum and glued it on to a fresh leaf.

Not more than one must be put on each leaf for as soon as they hatch they go at once to the extreme point of the leaf, so if two get on to one leaf there is liable to be trouble.

I kept them in a cold greenhouse all winter and did not lose one.

When they are ready to hibernate they spin a web near a bud and sleep there all winter.

If you once get over hibernation you have won, providing you keep them on nice fresh food.

I quite agree with Mr Holroyd that ova hunting should be the only method used; all others are wasteful with this fine insect.

E. HARRISON (1676).

DISTRIBUTION OF ORTHOPTERA

Would fellow-members of the AES care to co-operate in an inquiry which I have instigated, through the British Empire Naturalists' Association, into the distribution of certain *Orthoptera*, namely Grasshoppers and Bush Crickets (the so-called Long-horned Grasshoppers), in Britain? In the first place, it was intended that the investigation should be a local one, but, as I pointed out in a preliminary note in the B.E.N.A. Journal*, the geographical field of investigation could well be extended if sufficient organizations and individual entomologists were interested.

It must be admitted that, largely because orthopterous species have been much neglected, our knowledge of their distribution is far from complete. This deplorable lack of knowledge was emphasized by Dr Malcolm Burr when he compiled his well-known standard work† some years ago, and in a quite recent booklet‡ another authority, W. D. Hincks (531), points out that "there is still much work to be done on *Orthoptera* in this country. The general distribution of even common species is inadequately mapped, and the ecological factors associated with their more detailed distribution offer a field for many workers." Like Dr Burr, he suggests various aspects which offer almost boundless scope for study and research in the field.

Amateurs, however young or inexperienced, should encounter relatively little difficulty in identifying our comparatively few members of the families *Tettigoniidae* and *Acridiidae* (the only orthopterous groups with which, for the time being, I am concerned) after a preliminary 'canter' or two in the field; but doubtless where 'difficult' species or interesting varieties or local forms turn up, local museums and kindred institu-

tions would gladly assist. In the South-East, the Haslemere Educational Museum has already promised such assistance as is practicable, while preliminary responses to invitations to co-operate indicate that Natural History Societies and school groups are prepared to help.

In addition to miscellaneous or special observations calculated to throw light on the distribution of our Grasshoppers and Bush Crickets, the writer will be glad to hear of the occurrence of noteworthy varieties or local forms (whether 'new' or previously recorded); similarly, local and county lists would be of great value in bringing county or vice-county, as well as purely local, distribution records up to date.

The two works mentioned in these notes, which between them give descriptions and illustrations of species, with some distribution maps, should be of considerable help to observers who wish to assist in this inquiry. Further information, if desired, can be obtained from the writer (address: 56 Cranmore Lane, Aldershot, Hants.).

PETER MICHAEL (748).

**Country-Side*, April-May, 1950; pp. 239-240.

†*British Grasshoppers and Their Allies* (1936).

‡*R.E.S. Handbooks for the Identification of British Insects*, Vol. I, Part 5: Dermaptera and Orthoptera (1949). 3s 6d. Obtainable from the Royal Entomological Society of London, 41 Queen's Gate, S.W.7 (3s 8d post free).

COMMON MARBLED CARPET

Towards the end of March (1950) I found a number of caterpillars of the Common Marbled Carpet (*Dysstroma truncata*) feeding on honeysuckle in a wood near Pershore, Worcs. They pupated almost at once, and the moths emerged at the end of April. This may be worth recording, since I cannot find any reference to honeysuckle as a natural foodplant of *truncata* although P. B. M. Allan (*Larval Foodplants*) mentions that they will eat it in confinement. The caterpillars were all of the form which has a rosy stripe on the sides; and the moths were all ab. *perfuscatum* Howarth.

JOHN MOORE (146).

QUICK DRYING FOR ORTHOPTERA

I was interested in Mr P. H. Holloway's article in *Bulletin* No. 112, p. 31, on "A Quick-drying Method for Lepidoptera." I regularly employ the same method with *Orthoptera*, with great success.

My first attempt was made more than three years ago. I had bred a large number of a locust (*Locusta migratoria* Linn.) and over a hundred set specimens in various stages were required urgently for examination purposes. I set them and wondered how I was going to get them dried off quickly enough. I had an idea—a hot oven. I heated up the oven, placed one of the boards inside, and, hoping for the best, left it for a couple of hours.

Upon taking it out, I found that the locusts were perfectly dry, and, most important, had maintained their original shape and coloration. Since then, I have subjected all my *Orthoptera* (grasshoppers and bush crickets) to this treatment, with excellent results.

The advantages, in addition to the fact that the boards are always clear, are that I do not have to cope with grease and the insects do not work loose on their pins, as so often happens with the larger *Orthoptera*. The delicate shades of green and brown fade only a very little.

J. A. RANGER (1002).

QUICK-DRYING LEPIDOPTERA

I used to put my boards in a warm oven to dry, when I first started collecting, but soon gave it up, as I was not so lucky as Mr Paul Holloway (429). I found that among the ills my attempts suffered were: warping of boards; immediate 'greasing-up'; sticking of wing-tips and margins to the boards; general buckling of the wings after removal, cooling, and 'unsetting'; and 'springing' itself!

PETER G. TAYLOR (719).

THE LABELLING OF SPECIMENS

Mr Whicher still defends his system of numbering instead of labelling (*Bulletin* No. 112, p. 31), though only in cases where the insects "have no value as specimens" but are used for study. He goes on to say that he knows two entomologists who are writing important contribu-

tions to the science "but nobody else would understand their collections and their specimens would be of little use to any museum."

Possibly so; but it is a dangerous doctrine. Their work, if it is really important, may some time require to be checked by other entomologists. Since it is presumably based on meaningless collections, this cannot be done. Again, surprising discoveries are sometimes made by accident: for example, it is not beyond the bounds of possibility that a man examining long series of insects for some quite different purpose may hit upon a notion which will lead to an advance in the study of genetics. But if the specimens are not properly labelled his notion remains a guess; it may never be proved. The discovery of penicillin was made by accident; conceivably if the relevant microscope slide had not borne a label it would not have been apparent that a particular mould killed a particular bacillus.

Surely accurate labelling is the very scaffolding of science, even though the worker "intends that his contribution to knowledge shall be a written one." Oddly enough, on the very next page of the *Bulletin* the interesting article by Mr J. Briggs (*Moths Visit Town*) provides the perfect example; for this written contribution to knowledge is rendered completely valueless because its author has omitted to state in which industrial city his moths were caught. This is all the more unfortunate since his list contains two moths which were "new to the local Society's records." May I humbly suggest that such a slip might easily result from failure to observe the dull but simple, elementary but essential, rules of scientific method?

JOHN MOORE.

[Note:—The industrial city is Bradford. The Editor regrets the omission.]

MIGRANT RECORDS

CAPTAIN T. DANNREUTHER (60) has kindly allowed the Editor to extract items of interest from his full report for 1949 (which appeared in a condensed form in the *Entomologist*).

From Dr R. Loeliger's monthly circular *Ründschreiben von Schmetterlings-Wanderflügen*, Zürich, No. 24, dated January 31st, 1950, is taken an

account of the start of a migration of Painted Ladies from Tipaza, 30 miles west of Algiers, where at 9 a.m. on June 3rd, 1948, Otto Egli of Basle witnessed the simultaneous emergence of some 2000 *Vanessa cardui* from thistles along the coast and saw the beginnings of a mass flight north-east towards Sardinia, all had left by 10.30 a.m. This must have been a most thrilling sight. The same publication, *Circulaire No. 21*, gave an account of a migration of well over a million *V. cardui* through Switzerland in mid-June, 1949. Both these migrations were north-easterly, so did not reach England.

In Great Britain, the season was more or less normal, except for a great invasion of *Nomophila noctuella*. *Colias croceus* (The Clouded Yellow) was in greater number than usual, though not in such profusion as in 1947.

In the Isle of Canna (W. Inverness) locally bred or captured specimens of *V. cardui* were marked and released. A few of these were recovered up to 130 miles to the S.E. It was not such a good year as 1947, or 1948, for the Painted Lady, but would be called somewhat above average.

The Red Admiral was first seen on April 17th and on October 13th a crowd of about 400 had accumulated at Littlehampton, feeding on rotten apples and pears. These were not seen to emigrate, however. An interesting record was that of O. D. Hunt, who noted a flight at sea, east of Plymouth, on September 26th, which included some *V. cardui* and *C. croceus*. The day was calm; but *atalanta* overtook his motor boat which was travelling east between 5 and 6 knots, while he overtook *croceus* at this speed.

The Clouded Yellow came over in considerable force. The invasion was not as large as in 1947 but larger than any other year since 1930.

The Humming Bird Hawkmoth and Silver Y were normal, but the Pyralid *N. noctuella* was reported in myriads in S.E. counties.

Among rare vagrants, there were reported three Monarch butterflies only, while seven Camberwell Beauties were seen. The Queen of Spain Fritillary (*Argynnis lathonia*) was slightly above average with seven specimens being recorded; but the high-light was *Celerio livornica*; 318 of these were reported between April and September, excluding 14 bred from larvae. Commander G. W. Harper (1169) caught and released 110 of these at Rustington, near Littlehampton. *Caradrina ambigua* was also reported in unusual numbers—one member, E. W. Classey (41), saw very large numbers.

Of insects other than Lepidoptera, an estimated 4000 of the Dragonfly *Sympetrum striolatum* were seen by T. Parsons (1513) to come in near Porthcawl from the Bristol Channel, flying north, on July 2nd. Ladybirds (*Coccinella septempunctata*) also were recorded as settling in swarms (perhaps wind-borne) at Hastings and Skegness. Only 50 Colorado beetles were reported, and these were mostly in imported produce or in shipping.

[Captain Dannreuther would like more voluntary observers to keep records of mass migrations and of rare migrant vagrants. Many AES members already help in this work but there are still insufficient records, particularly for Scotland and Ireland. The work required is not onerous and can easily be done by members who live in the country making records locally. It provides an additional daily entomological interest. Members who are interested and able to carry out these observations should write to Captain Dannreuther, "Windycroft," Hastings, Sussex, for further information.—Ed.]

THE CHIMNEY SWEEPER ODEZIA ATRATA LINN.

There seems to be much confusion over the larva of the above lepidopteron and I have compiled these notes in an endeavour to clear up this misunderstanding, both as regards dates and the colouring and markings of the larva. It is possibly on account of the contradictory statements of past writers that entomologists find this larva so elusive.

The following will give some idea of the confusion existing in various publications:—

STANTON (after BORKHAUSEN)—Larva green, with no markings. On Earthnut. May-June.

WILSON—Larva green or bluish-green. Markings fairly accurate. Earthnut. May-June.

BUCKLER—Colour and markings of green form accurate. Flowers and seeds of Earthnut. Pupated 8th June.

SOUTH—Green markings. Fairly accurate. Flowers of Earthnut. Spring.

SCORER—Gives May-June. Flowers of Earthnut.

NEWMAN & LEEDS—Life history accurate. On flowers of Earthnut.

It will be seen from this that the situation needs clarification. The facts are as follows:—

The ova are deposited loosely amongst the foodplant and surrounding vegetation and debris and lie amongst the decaying remains until they hatch at the end of March or early April; a little earlier or later, according to the season. I found them commonly, this year, in the second larval instar on March 25th, feeding on their usual foodplant, *Conopodium denudatum* (Earthnut).

I placed 30 of these larvae into captivity on March 25th. They fed up very rapidly and the first went down on April 16th, pupation taking place on April 19th. The remainder, with three exceptions, were all out of sight by April 27th.

A further twelve were collected on April 23rd, one of which was fully grown and which pupated on April 26th. The remainder were all well over half-grown on the latter date.

It is obvious from these dates that if one wishes to collect these larvae, it should be done during April and very early May, as stragglers only will be found in the latter part of May and June, which is given as the larval period by all the above writers. I have searched in this locality a number of times, in late May and early June, and never found one larva.

Nearly all writers give the flowers and seeds as the pabulum, but all the larvae this year have fed entirely on the foliage. At the time of writing (April 27th), no flowers have yet appeared in this locality and it will be possible for stragglers only to feed on other than the foliage.

All writers are agreed the larva is green, with various markings. This is incorrect, inasmuch as two distinct forms occur, i.e., green and brown. The green ranges from bright to bluish and in some larvae shows a slight "bloom" of white. I cannot do better than quote Buckler for the green form:—

"The larva when full grown is nearly three-quarters of an inch in length, cylindrical and stout in proportion and about equally thick throughout, rather shining and with distinct lines as follows:

"Ground colour of the back, green or bluish-green, becoming on the sides gradually paler towards the spiracular region. The dorsal line is darker green, and on the anal segment becoming dark red and thicker, forming a very conspicuous mark. The sub-dorsal stripe, of a darker green than the ground colour, and running between two fine lines of pale, whitish green, which in some individuals are also seen to be very finely edged externally with darker green.

"The spiracles are red, and below them the green fades into a whitish stripe, and it is forcibly contrasted beneath by a darker tint of the green of the back, softening gradually into a paler green on the ventral surface, where there are three longitudinal whitish stripes, the middle one being the widest."

Unfortunately, Buckler only had six specimens and all were of the green form. There is, however, a brown form, and of the first 30 I collected, 14 were of this form, and of the 12 collected later 4 were of this colour. The brownish form ranges from a pale olive drab to a bright, dark brown. In the paler forms the green of the food in the intestine shows faintly through both dorsal and ventral surfaces, but there is no pigment of this colour apparent when the intestine is extracted. The markings in both colour forms are identical, and Buckler's description alone is meticulously accurate.

The larva, in its early stages, assumes a most curious attitude, standing erect and coiling its front segments into a form resembling a question mark, and often bringing its head underneath to form about $1\frac{1}{2}$ coils, much as do some of the 'Acidalias,' or *Sterrhinae*, as they should now be designated. As it grows in bulk, it gradually loses this attitude and in the final larval stadium remains stretched out stiffly when at rest.

This is also one of the vibrating or threshing larvae, wildly waving itself about, both when stationary on the foodplant, and before each leap, in walking. What purpose this serves I cannot say, as it only serves to draw attention to itself.

The larva pupates in earth, but if kept in paper-lined tins will readily spin a slight cocoon of silk, attached to the damp bottom paper. It can be close-fed in tins and is extremely easy to rear. It feeds both by day and night, but hides during chilly weather.

P. B. M. Allan, in his *Larval Foodplants*, gives *Chaerophyllum temulum* (Rough Chervil) and *Chaerophyllum anthriscus* (Burr Chervil) as plants on which the larvae have been successfully reared; Buckler, however, states the larvae starved, rather than eat Chervil. I understand, however, that Mr Trought is finding they will eat one of the Umbelliferae, apart from Earthnut. The identity of this plant will be interesting.

I would be very glad to read any further notes on this interesting larva.

H. E. HAMMOND (419).

(Note:—The plant in question has been identified by Mr H. K. Airy Shaw (545) as *Anthriscus sylvestris* Hoffm. This is the Wild Chervil, *Chaerophyllum sylvestre* Linn., in *Bentham and Hooker's Flora*. My larvae hatched on April 6th and pupated on June 7th.—T. Trought.)

POPULATION NOTES

Recent notes about the relative plenty or scarcity of butterflies, such as that by Alan P. Major (1117) in the *May Bulletin*, No. 113, p. 43, are very interesting. My home is in Cumberland, and I was in the South twice last year, in the first half of May and in the first half of August. Whereas my impression in May was of a very good season, my August impression was that in spite of (or because of?) the very fine warm weather, it had greatly deteriorated. But here in Cumberland the butterfly population was good and healthy, and, if anything, above normal throughout 1949. The summer was fine here but by no means so intensely warm and dry as in the South. Though I fear I can bring no precise statistical evidence to bear on it, my conclusion, based on experience over a good many years, is that our resident butterflies are adapted to a more or less Atlantic type of climate, and that a period of weather of the Continental type is damaging to them in the summer, when they are active in one or the other stage of their life history, but leaves them unaffected in the winter, when in any case they are hibernating and can easily stand the rigours of cold. The season of plenty in 1947, after the Continental spell of weather in the winter, contrasts strongly with the season of scarcity in 1949, when the

Continental spell was in the summer. Hence, too, it appears from my own observations that it is the summer populations of butterflies which vary so markedly, whereas our spring populations remain far more constant.

The above remarks only apply, of course, to resident butterflies and are, no doubt, a great over-simplification of the facts; for many causes must be responsible for fluctuation in numbers, but the fact that, for instance, *Colias croceus* (the Clouded Yellow), a migrant, was common last year, even here in Cumberland, whereas *Nymphalis io* (the Peacock), a resident, was scarce everywhere, seems significant.

It would be interesting to know whether any further information has come to light as a result of the note of P. C. Le Masurier (978) in the *April Bulletin*, No. 113, p. 39, concerning the surprising capture of a specimen of *Melitaea athalia* (the Heath Fritillary) in N.E. Hampshire in each of two successive years. I, myself, made one of the captures, but could trace no colony. I attached little importance to it (since various explanations of that odd specimen could be thought of) until I knew of the capture of another one in the next year, in nearly the same place. Both specimens are males. The occurrence is certainly strange.

J. H. VINE HALL (1520).

NOTES AND OBSERVATIONS

KEITH H. HYATT (1411) notes that on February 14th, 1950, he found a specimen of *Caradrina clavipalpis* (Pale Mottled Willow) Scop. in the Natural History Museum, South Kensington, in perfect condition. According to South, the moth flies chiefly in July and August, but is sometimes seen as early as May and as late as October. He continues that he has made enquiries in the Entomological Department and no one seems to have bred this species in recent years. He says: "What makes me feel it was a wild specimen is that it was very warm outside that day and my windows were wide open, so it easily could have flown in." (Or, possibly, owing to the mild autumn, an autumn larva may have fed up quickly, come indoors to pupate and been forced to an early emergence in the artificially heated room of the Museum.—Ed.)

H. B. SARGENT (1189) records that he took one *Vanessa cardui* (Painted Lady), male, in his garden at Breage, Helston, Cornwall, on April 7th, 1950. It is faded and rather worn, looking like a "left-over" from last year; more likely a hibernator than a migrant.

D. H. HEPPELL (1690) writes:—On May 7th, 1948, at Flowerdown, near Winchester, I took one *Chiasmia clathrata* ab. *nigricans* Ob. (Latticed Heath). Later in the same month, also on Flowerdown, I took one *Hadena albimacula* Borkh. (White Spot), which South states to be fairly rare. I would appreciate any other records of these two species from other members. (Address:—3 Jacomb Place, Bridgmar, Gosport, Hants.)

REVIEWS

Proceedings and Transactions of the South London Entomological and Natural History Society, 1947-48 (pp. xviii + 241 + 10 plain + 3 col. plates. Published by the Society, Burlington House, London, W.1. March 1949. Price, 30/-).

This volume of the Proceedings and Transactions of the "South London" is the biggest issue yet. The first 73 pages deal with the proceedings and contain two plates of varieties that were shown at the annual exhibition. They also contain the President's address, which is useful in

that it collects together the Lepidoptera that have been found in this country since Meyrick's Handbook was published in 1928.

There are 11 papers in the Transactions. "The Technique of Breeding Lepidoptera," by A. V. Hedges. This is not so broad in scope as its title implies, being mainly concerned with the author's experiences with some of the more difficult species.

"A Contribution towards the Biology of *Aromia moschata* L., the 'Musk Beetle,'" by Evelyn A. J. Duffy. This is a very full account of the anatomy, habits and distribution of this species. It is well illustrated both by diagrams and plates.

"On the Function, Origin and Classification of Pupae," by Dr H. E. Hinton. This paper discusses and answers the questions that its title implies. The question of whether the pupa is a larval or imaginal stage is discussed. Methods by which pupae are equipped to break out of the cocoon, and by which adults break out of the pupae are also discussed and illustrated by diagrams. An indispensable paper to all those interested in pupae and in evolution.

"*Arctia caja* L., its Variation and Genetics," by Dr E. A. Cockayne. Illustrated by two coloured plates of varieties, this paper gives a full account of the varieties of *A. caja*, including the naming of a number of new forms.

"The British Lamproniidae and Adelidae," by S. Wakely. Once again, we have a paper on the "micros," illustrated by a coloured plate. A key to genera and species is provided and information is given as to larval foodplants and times of appearance of the species. This paper should make the identification of members of these two families easy, even for the beginner.

Other papers include "*Adelia viridella* Scop.," by Rev. D. P. Murray; "Some Trap-door Spiders from Algarve," by Hugh Main; "Collecting in 1947," by Air-Marshel Sir Robert Saundby; "The *Chironomus* Fly," by E. J. Bunnett; "Occurrence of a species of *Blastobasis* resembling *decolerella* Woolaston, in South London," by S. Wakely; "Some Notes on the Coleoptera of Epping Forest," by F. D. Buck. A very full index is provided. The volume is well brought out and produced, as regards contents. The only typographical error we noticed is on the spine, where the

date is wrongly given as 1948-49. It is a pity that the price may put it beyond the reach of many as it is a volume well worth having. We have, however, one serious criticism to make and that is the fact that staples are used for binding. This makes it difficult to read as the pages will not stay flat of their own accord. Surely such an otherwise excellent publication deserves a better binding.

BRIAN O. C. GARDINER (225).

Collecting Butterflies and Moths, by Ian Harman, published by Williams and Norgate Ltd., with 7 plates and 128 pages; price 7/6.

In this useful and instructive little book the author has succeeded in giving as much information as possible in the space available on the various aspects of collecting, equipment, setting and care of the collection.

In the few errors and omissions that the reviewer noted, one or two are worth mentioning. On page 13 I would have preferred to have seen the use of the word "parasitic" rather than "ichneumon," and to have seen included in the equipment chapter a small heading, "Note Books and Diaries." On page 15 there is no mention made to the second pair of abdominal legs in the description of a Geometrid larva.

In the last chapter the author gives an "Entomologist's Calendar," which includes a list of the more common species, month by month, that are likely to be encountered, but he does not recommend a text-book that will help the beginner to identify his captures and to help him know the actual insect that is referred to in the text (South, etc.).

The inclusion of the chapter on the "Microlepidoptera" is very welcome, as these interesting little moths are too often neglected, due, no doubt, to their size and the consequent difficulty in handling them.

The photographs of the imagines are in themselves quite good but serve no real purpose other than decoration and only add to the cost of publication. No mention is made of the actual size of the insects illustrated and those of the Irish *P. napi* and *C. croceus* var. *helice* miss their mark through not being coloured. More photos. of equipment would not have been out of place.

Apart from the points noted above, this is an excellent book for the enthusiast, whatever age, who wants to know the "Hows" and "Whys" of collecting. The descriptions and instructions are clear and concise without being puerile, a pitfall into which the writer of a book such as this might so easily fall.

T. G. H.

CORRESPONDENCE

TO THE EDITOR, A.E.S.

1st June 1950.

Dear Sir,

With reference to the review of the first number of *Entomologist's Gazette*, which appeared in *AES Bulletin*, No. 114, June 1950, your readers may like to know that we have decided to abandon printing in facsimile typescript. Part 2 and onwards will appear in the more conventional type.

This, we are glad to say, will not affect the number of pages (already increased in part 2) and we shall also continue to use a large number of illustrations.

I note that your reviewer states the price to be "20/- per annum or 6/- per issue"; in fact, the price of each issue will depend on the contents and 6/- will be the minimum price for any one part. Some parts will cost considerably more than 6/- but, of course, the subscription rate of 20/- will (we hope!) not alter.

The criticisms in your review are justified—and we hang our heads in shame—but we will do our best to improve matters and must enter a plea of inexperience (a cardinal sin of the young).

I sincerely hope, and believe, that before we are a year old we shall be well past our teething troubles.

Yours sincerely,

E. W. CLASSEY, Editor, *Entomologist's Gazette*.

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Applications for new membership to: S. M. HANSON, 167 Gunnersbury Park, London W.5. Also offers of help with AES work, and suggestions for improvements in our organization.

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AES

No. 116

BULLETIN

AUGUST 1950

ANCESTRAL INSECTS

Resting from the chase in a hot sun and listening drowsily to the trilling of grasshoppers, has it ever occurred to you to wonder how many thousands of years that cheerful noise went on before there were any men to hear it? The answer is not to be counted in thousands of years, but in millions. Fossilized Orthoptera which show clear stridulating organs have been found in rocks which were laid down one hundred and fifty million years ago (the Jurassic period). Man has certainly not been here more than a million years; the sort of men we are, perhaps only thirty thousand.

Are these, then, the very earliest insects? Emphatically not. The *Protorthoptera* (the forebears of the locust tribes) were abounding twice as long ago; and the *Palaeodictyoptera*, the earliest recognizable insects, from which all our modern orders have apparently been derived, were probably hopping or flying four hundred million years ago.

The fossil record has many blanks in the history of most orders: only the cockroaches have an ancestry which can be traced through all the periods from the Carboniferous Age (say three hundred million years ago) to the present day. With that history, is there any wonder that they love the heat of kitchens and bakers' ovens now?

The *Bulletin* last year contained several records of insects in coal mines. These were living. But members who dwell in mining areas might also keep open eyes for traces in the Coal Measures, the rocks which lie above and below the seams of coal. We might all derive a little bit of pleasure from examining the unburnable stuff which annoys us so much when delivered by the coal merchant in among the coal we so dearly pay for! Besides those mentioned, we might come across traces of the earliest dragonflies (*Protodonata*), the earliest mayflies (*Protephemeroidea*); but nobody has yet found there an

ancestral beetle, bee, butterfly or moth.

Another place to look for fossil insects is in the ironstone nodules that occur in some beds of clay. If you find any, carry them home; heat them over a fire; and drop them into a bucket of cold water. They will probably split across in the plane of any fossil insect within.

What are your favourite orders? You won't be collecting British Mantids, because they have long left our shores (although we sometimes nurse exotic ones carefully in our breeding cages). Nevertheless, they are to be found in Permian rocks in this country and must have preceded us by two hundred and fifty million years. There were already 350 species of beetles (not all in Britain certainly) one hundred and twenty million years back (the Mesozoic Ages). Bees, wasps and ants were all alive and teeming among the grasshoppers. Ants and Diptera, particularly, turn up in Baltic and Sicilian amber up to fifty million years old. Fleas are that old at least; butterflies and moths left their impressions in rocks three times as long ago. The earliest moths had no mouthparts (like, for example, the Silkmoths of to-day) and cannot have lived long in their adult stage. How amazing it is that any at all left traces. Yet we know of 85 species of Lepidoptera which flourished seven million years ago.

Whereabouts may we go looking for fossil insects? Well, it is a forlorn hope of finding them; but how exciting if we do. They occur most among the Purbeck and Wealden rocks, the Bagshot Beds and the Bembridge Beds. You will need the geological page of your atlas to show where these come to the surface. The best bet is a holiday in the Isle of Wight. If you are going to France, the richest insect-treasure has been found at Commentry (Allier). It was there that they discovered a dragonfly which measured 75 centimetres in wingspan.

W. J. B. CROUCH (1181).

FESTIVAL OF BRITAIN

It is with pleasure that we congratulate our member, L. Hugh Newman (503), on being appointed Official Entomologist to the Festival of Britain. We are all anxious to make the Festival of Britain a great success and show our foreign friends that not only are we not down-hearted but very much up and coming. As entomologists we can, therefore, assure Mr Newman of our hearty co-operation. He will doubtless let us know, in due time, how we can help him.

SPRINGING, DROOPING AND CURLING

(Continued from Bulletin No. 114, p. 55)

Insects left too long in the killing bottle, particularly if it is cyanide, often give springing trouble, since some killing agents seem to accentuate *rigor mortis* or accelerate the muscular drying and contracting. The best way to avoid springing is to remove the insect as soon as it is dead from the killing bottle and to place it immediately in a relaxing tin in which it should be left for three days and then set. The relaxing tin should not be too damp or other troubles will arise. The ordinary chopped laurel leaf relaxing tin is best provided the leaves are renewed regularly. If, however, it is not possible to place the insect in the relaxing tin quickly after it is dead the only solution is to keep it eventually in the relaxing tin until the test, mentioned on p. 56, with the antennae, is satisfactory. In the case of a specimen which is definitely dry and difficult to set it will have to be left in the relaxing tin longer and a careful watch kept to see that the wings do not get wet. In such cases a liquid relaxer of the type which can be bought is probably better than laurel leaves. In such cases also, before the setting is done, it is advisable to grasp the insect with the forceps at the base of the wings or slightly below from the lower side and squeeze it firmly three or four times. This must be done skilfully and carefully if damage is to be avoided; in difficult specimens it should be done once or twice at intervals of 24 hours and the insect returned to the relaxing tin. This action loosens and breaks down the muscles sufficiently

to prevent springing. It is also advisable to set such specimens rather higher on the pin when setting than is usual—only a shade higher is sufficient.

(To be continued.)

R. E. PARSONS (1512).

LOCALIZATION OF THE DARK GREEN FRITILLARY TO VERY SMALL AREAS.

In June 1948, when stationed at Winchester, I visited Flowerdown several times, and on one occasion took three *Argynnis aglaia*. They seemed to occupy only a small area about 50 yards square, and nowhere else on the down were they to be found.

The following year (1949) I visited the same spot and, sure enough, there they were, occupying the same area and, again, to be found nowhere else.

Dog Violet and wild pansy were abundant all over the down and I am at a loss to account for its being so closely restricted to this small area. Perhaps other readers can throw some light on this problem.

D. H. HEPPELL (1690).

NOTES AND OBSERVATIONS

TREVOR B. POOLE (1681) of Toller Lane, Bradford, Yorks, has started keeping records and making a collection of Humble Bees in his own locality. He reports that this year (1950) plenty of queens were on the wing by the end of March. By April 13th he had recorded queens of *Bombus terrestris* Linn., *B. lucorum* Linn., *B. pratorum* Linn., *B. jonellus* Kirby, and *Psithyrus bohemicus* Seidl. Owing to bad weather the bees were not flying, and no new species appeared till May 10th, when warm sunny weather brought out queens of *B. agrorum* Fabr. Queen wasps of *Vespa vulgaris* Linn., *V. sylvestris* Scopoli., *V. norvegica* Fabr. and *V. rufa* Linn. were also recorded up to May 11th. (See also Wants and Exchanges sheet for July 1950.—Ed.)

R. F. ALDERTON (1170) writes that he took a perfect specimen of the Pine Hawk (*Myioicis pinastri*) at light at about 11.30 p.m. on Sunday, June 4th, 1950, at Woldingham in Surrey. He thinks this is an unusual locality for the Pine Hawk.

COLLECTING IN KENYA

It is nearly forty years since I collected moths in England; and on re-reading lately some of my old diaries of those happy days—and nights—I have been struck by certain differences between collecting there and out here in Kenya.

For instance, in collecting imagines, I have found sugaring most disappointing. The most alluring patches on tree-trunks and fence-posts fail to produce moths in any quantity, though they attract beetles, biting ants and so on. The only successful sugaring I have done is on tied-up bunches of grass. These will sometimes produce swarms of *Noctuidae*—largely *Borolia*, *Cirphis* and *Senta*, which take the place of the common English *Leucaniids*. There come also many *Plusiids*, some of them very handsome; and an occasional visitor is a large "Skipper"—*Coeliades florestan*—which also comes to the lamp, even late at night. It is well to clear a big space round the foot of the sugared bunches: for moths that fall to the ground attract toads, toads attract snakes, and a snake, if trodden on, is liable to bite the Entomologist. Again, if you are sugaring on the edge of a forest, it is as well to have a companion, perhaps with a gun. That sudden crash among the trees may be only a falling branch: or it may be only a big buck, startled by your lamp; but it *might* be a buffalo. If so, it will be well to leave that particular sugaring-run for another night. There may be entomologists with a steady enough hand to box a moth from a grass-head with a "buff" stalking them—but I am not one of them.

Light, on the whole, is far more successful than sugar. My house has an L-shaped, whitewashed wall, with a powerful electric light in the angle of the L. This wall is often covered with moths; and now that I am getting old I do not often go further afield than this. I seem to remember at Home that male moths used to come much more freely to light than their females. That is definitely not so out here. In the *Syntomidae* and *Lasiocampidae*, for instance, the females always seem to preponderate. I have seen my wall almost covered with the big yellow females of *Bombycopsis conspersa*—hundreds of them, I suppose—and never a male among them. A cer-

tain number of moths come to the lamp a'l the year round; but it is when the Rains break that one is kept really busy. The work then is more fast and furious than even on the best nights that I can remember on Wicken in the old days.

But most of my work is among larvae: beating, searching, and rearing from ova. Searching is not very productive; largely because one has not the slightest idea what one is searching for. Many of our larvae are exceedingly well camouflaged. There are stick-caterpillars "stickier" than any I remember at home. There are others that dress themselves up, as does the larva of *E. smaragdaria*. There is at least one that looks just like one of the big biting ants, recalling young "Lobster" caterpillars at home: and there are the big *Lasiocampids* that lie so close to a branch that you just can't see them at all. These last are also armed with the most poisonous hairs, which they force on your attention by a violent sideways jerk of the thoracic segments: and if your finger is anywhere near, it will be sore for days. Since some of these larvae are quite five inches long, their striking range is considerable. *Pachypasa bilinea* is one of the worst.

Beating is much better fun; especially since I have the advantage of using one piece of "apparatus" that I never had at home. This is a Native, who can climb anything, and goes up—tray, stick and all—to beat the topmost branches of big trees, where many larvae congregate. But there are many difficulties in rearing larvae. I find a very much greater proportion of "stung" larvae than I did at Home. In a batch of beaten larvae there are almost sure to be some ichneumonid. Ova also, when taken in the open, often have their parasites; and I have come across some cases of "big fleas with lesser fleas"—that is, the cocoon of a large ichneumon on one of my larvae will discharge a host of tiny flies, who leave their own tiny cocoons inside the large one. So one has many disappointments; though when I see the myriads of *Ichneumonidae* that come to my lighted wall, it is difficult to imagine how any lepidopterous larvae at all escape their attentions.

Sleeping larvae in the open is not possible; wandering Natives steal the sleeves at night for purposes of

their own almost as soon as you put them out. But perhaps my greatest difficulty is to find the right food for my larvae. Take the case of ova that have been laid by a female that came to the light. In England, you just look up the moth in the book, and there you are. Not so here. Many of the moths are unknown, and almost all of their larvae are unknown. Therefore, so are the foodplants. It is a case of providing a mixed salad of anything and everything within range, and hoping for the best. I always divide up the newly-hatched larvae into several small receptacles, put several kinds of food into each, and look anxiously for frass. If none appears, more and more kinds of food are tried. But I lose many batches through failing to find anything that they will eat.

Again, some Noctuids deceive one by laying their ova on the leaf of a bush which their larvae will not eat. This defeated me for some time, until I discovered that the leaf dries up and falls before the larvae hatch out, and their proper food is the grass among which it has fallen.

When the larvae have pupated, one has to learn that it is not differences of temperature that govern the time for emergence, but differences of moisture. The greater number of moths emerge when the Rains have started; and if (as is often the case) the Rains should fail, even very small pupae are quite capable of "going over" for one or even two years before emerging. So one has to try to reproduce out-of-doors conditions for the indoors pupae; giving them a small daily damping to represent the heavy dew of the dry season, and a real thorough soaking when the Rains are due. In fact, moths can often be forced out by an untimely soaking of the pupa-cages during the dry season.

The greatest difference of all is that so much of the work is new. There is no question of going to the Fens at a certain time for a particular species, or to the Broads or New Forest for another. One never knows what may turn up. Species new to one's own collection, some new to Science, are always appearing; and, as for the early stages, workers in this subject are so few that knowledge in it is very limited indeed. So the field of work is enormous. I myself generally breed out about a hundred species each year. If only some-

thing could be done about those infernal *Ichneumonidae* and also about the grass-fires that yearly devastate hundreds of acres of foodplants, I should probably manage to do much more.

AUBREY L. H. TOWNSEND (1691).

STILL MORE PREDATORY WASPS

I should say that it is a usual occurrence for the Wasp to attack living insects, being the cold-blooded murderer that he is, but, in answer to R. H. Benson's query, *Bulletin* 110, p. 18, I don't think he *feeds* upon living or freshly-killed prey. To bear this out I give the following instance.

One day in July, 1948, I was walking across a grass-covered chalk bank near my home when I noticed a wasp on a grass blade. On closer examination I found that it had paralysed and pinned a Great Green Grasshopper to the blade and was busy cutting it up. First of all it cut round the base of the head until the head fell to the ground; then it cut the "tail" off. The remainder of the body it skinned, rolled into an oval-shaped ball (the shape, I presume, giving least wind-resistance in flight), tucked the ball underneath itself and flew off, probably to the nest. I know I was so intrigued by this performance that I forgot to identify the wasp, though I remember it was one of the *Vesputa* family.

I have also seen common wasps fly into a room and seize bluebottle and house flies, the flies usually making a terrific buzzing noise in their efforts to escape.

And no wonder!

ALAN P. MAJOR (1117).

I have often lost specimens of lepidoptera while still on the boards, owing to wasps removing abdomina.

PETER G. TAYLOR (719).

LARVAL COLOURS

Reference *Bulletin* No. 110, p. 19, much has recently been said, but little done, concerning insects, particularly lepidopterous larvae, which have two colour forms: a dark one with a tendency towards brown, and a light one, tending to green. Instances which come to mind are Elephant Hawk (*Deilephila elpenor*), Pale Tussock (*Dasychira pudibunda*), Large Yellow Underwing (*Triphaena pronuba*), Broom (*Ceramia pisi*), and Silver Y (*Plusia gamma*).

It has been suggested that there seems to be some connection between colour and local population density, in that larvae found or kept in a solitary state tend to be greener, and less brown, than those of the same species found or kept in swarms or crowded conditions, where the converse is true. Although Mr R. W. Watson says that his larvae were kept "under natural conditions," I imagine he sleeves batches, if not the whole brood, together on branches of willow or hazel bushes, thus forcing upon them a crowding effect. I suggest he divides his next brood in two, and feeds one half as a swarm, and the others singly in separate sleeves.

As all my Pale Tussock larvae were found and kept singly, I hadn't seen the dark form until Miss Barbara Hopkins (827) showed me some she was breeding as a batch at Rothamsted. I certainly have found that, of many dozens of Elephant Hawk larvae I have kept, those found while still young, and kept together, seemed to go darker as they grew, whereas 'wild,' full-grown larvae, collected at the time, seemed to be greener.

It would be interesting to hear the experiences and ideas of other members regarding this phenomenon.

PETER G. TAYLOR (719).

HAMPSHIRE COUNTRYSIDE

PART II

(Continued from p. 28)

Continuing my notes in October, 1949, I should like to make mention first of the joy of such a grand *croceus* season. The profusion of *helice* in my local lucerne field was unequalled in my memory, although 1947 was good. Turning to my log for random jottings, the following observations were, to me, the most pleasant:—

Oct. 1—The month started hot and sunny. Eleven *helice* amid the abundance of *croceus* on lucerne.

Oct. 2—Two *helice* and two *cardui*.

Oct. 7—Larva of *psi* found crawling on bare ground under an apple tree. Fed on apple and pupated Oct. 12.

Oct. 8—Skylarks singing over a sun-drenched lucerne field. Among *helice* taken, one large intermediate form appeared. Two *stellatarum* around delphinium.

Oct. 14—Observed *stellatarum* at pentstemon. *Atalanta* in abundance enjoying fallen pears.

Oct. 16—Dull, warm afternoon following rain. In the woods: several species of fungi, first Furze bloom, Violet Ground Beetle (*Carabus violaceus*), and Aeshna Dragonfly.

Oct. 17—A few moths at ivy bloom after two almost blank weeks. The first male *defoliaria* at light.

Oct. 23—In Park Hills (how I love the name and that bit of country): Long-horned Grasshoppers (*Mecanema thalassinum*), a female on a hazel leaf, and *Leptophyes punctatissima*, female on a pine trunk. Several water beetles (*Agabus bipustulatus*) in a cattle-drinking trough and literally hundreds of *Phaedon armoraciae* (Col.: *Chrysomelidae*) under loose bark of decaying willows. Dog Violets in bloom.

About thirty queen wasps have been found recently hibernating in folds of curtains in two back rooms.

Nov. 1—Cold, North wind, sunny. A few *croceus* and *atalanta* flying in the garden.

Nov. 2—Two Great Tits tapping at a frosty window pane while I was having breakfast.

Nov. 6—Fair morning, with *croceus* and *atalanta* flying in the lucerne field.

Nov. 11—Pied Wagtails prominent over and around the garden.

Nov. 16—At my bird table, a succession of Sparrows, Blue-, Great- and Cole-Tits and the neighbour's cat!

Nov. 18—Like a day of summer. Observed a male *rhamni* and an *io* in flight.

Nov. 19—At light: Sprawler (*sphinx*). November moth (*dilatata*), Mottled Umber (*defoliaria*) and Caddis-flies.

Nov. 25—Emergence of female Pale Tussock (*pudivunda*) in a friend's puparium. Male December moths (*populi*) appearing commonly at light.

Dec. 2—Shield-bugs* and Seven-spot Ladybirds (*C. septempunctata*) common on Furze bushes.

Dec. 6—Found a male Scarce Umber (*aurantiaria*) resting under a leaf of a low plant in the woods, one wing-tip only being visible. Nut-hatches noisy.

Dec. 20—The first Winter Irist in bloom in the garden. A lame Magpie came within a few feet of the back door. A Blue Tit made two attempts to remove the metal cover of an empty milk jug by flying at it and kicking violently.

Dec. 25—Typical of other Christmas Days of recent years: mild and damp, with an almost ceaseless chorus of Thrushes from dawn until dusk.

Dec. 27—An evening with light in the woods revealed an abundance of *brumata*; three pairs discovered *in cop*.

So ends another year of pleasant memories, another year with Nature

PAUL H. HOLLOWAY (429).

*[No doubt *Piezodorus lituratus* F. (Hem., Pentatomidae).—H.K.A.S.]

†[Perhaps *Iris unguicularis* Poir. (*I. stylota* Desf.).—H.K.A.S.]

INSECTS AND MOTOR CARS

Following the note by R. C. L. Howitt (*Bulletin No. 111*, p. 21) on Water Boatmen falling on his car bonnet, I had a similar experience in Perthshire last August (1949).

The car, a black saloon, was standing in the hot sun about 10 a.m. thirty yards from a small burn. Large numbers of stoneflies were alighting on the roof and bonnet, laying clusters of eggs, then flying off again. Some could not free themselves because the heat of the metal car body dried up the egg mass almost as it was laid. The car was soon very liberally spotted with white patches of eggs.

I feel that a net fixed on a car travelling at night would hold some good catches. Many moths seen in the headlights look huge, but this may be an illusion.

A. TODD (1197).

(Note:—As the Society does not wish to lose members, the Editor cannot recommend anything likely to distract the car driver's attention from the road.)

A CASE OF CANNIBALISM IN BEETLE LARVAE

On March 5th I took two larvae of *Mycetochara humeralis* F. (determined by Dr F. van Emden) and a large larva of *Athous villosus* Fourc. from under the bark of a log in Epping Forest. They were confined in a fairly spacious tube, the cork of which was somewhat irregular. One of the *M. humeralis* larvae manoeuvred its way into one of the cracks in the cork—a feat which led to its death. The *A. villosus* larva

decided to eat its way out and in doing so bit into the unfortunate larva in the cork. On being shaken down, the elaterid larva released the other and, leaving it dying in the tube, went back to work on the cork. It is conceivable that a similar type of accident could occur in the normal habitat, so that a sub-cortical larva has to number amongst its possible enemies other larvae whose paths it may cross, even though these other larvae are not usually carnivorous.

J. GREEN (1044).

NEWS ITEMS

The Ninth International Congress of Entomology will be held at Amsterdam, Holland, from 17th to 24th August 1951.

The General Secretariat Headquarters, 136 Rapenburgerstraat, Amsterdam, should be written to for further information. The Congress fee is 40 guilders per member and 25 guilders for an accompanying member.

We welcome the CAMILLA NATURAL HISTORY CIRCLE which has been founded fairly recently in the Southampton area. A group of AES members is the mainspring of the Camilla Circle—Ian G. Farwell (1445), Chairman, Robert W. Watson (752), Secretary, and Paul Holloway (429), Treasurer. The Secretary's address is 15 Halstead Road, Bitterne Park, Southampton. We wish the Circle every success and prosperity.

BEETLE EXTRACTOR

Reference Mr A. L. Capener's article in the May *Bulletin*, No. 113, p. 46, on the above, W. J. WATTS (249), asks: Why go to all that trouble when the dung which has been brought home can be put in a pail of water? It is surprising the beetles that will come out of it in two or three minutes. He once collected some almost dry deer dung from Arundel Park. In the field he could not see a single beetle, but when put in water he found it swarming with *Aphodii* and *Staphylinidae*.

P. G. TAYLOR (719) suggests that, instead of water being passed through the jacket ('9' on diagram E), steam could be passed in at the top and out into the air at the bottom (to prevent blockage by condensation) much more efficiently.

FRONTINA LAETA, MG.

In January 1944 Mr E. W. Classey (41) sent me a puparium of a dipteran parasitizing a larva of *Smerinthus ocellata* Linn. The fly duly emerged in February of that year and after mounting was stored away for future naming.

Mr K. G. Smith (897) has now undertaken the naming of all the dipteran parasites I have bred from lepidopterous larvae, and I am pleased to state this is the first British specimen bred from a named host.

Previous British records are:—Five captured by Dr Day at Wareham, Dorset, and one by the late C. J. Wainwright at Wick. The *ocellata* larva from which this specimen was bred came from Mytchett, Surrey, and thus, in addition to being the first bred specimen, this is a county record for *Frontina laeta*.

Abroad, *Frontina laeta* parasitizes both *S. ocellata* and *Malacosoma castrensis* Linn. It is interesting to note *S. ocellata* is also a host in Britain.

I am indebted to Mr K. G. Smith for kindly supplying particulars of the above previous records.

H. E. HAMMOND (423).

THE STRANGE CASE OF THE ENTOMOLOGIST'S HEART

Consider the case of Mr Suggs.

He was an eminent entomologist, which is to say he knew nothing but bugs. He could tell the Coleoptera from Lepidoptera,

And the Aphidae and the Katydididae from the Grasshoptera.

He didn't know whether to starve a cold or feed a fever, he was so untherapeutical,

But he knew that in 1737 J. Swammerdam's *Biblia Naturae* had upset the theories of Aristotle and Harvey by demonstrating the presence of pupal structures under the larval cuticle.

His taste buds were such that he was always asking dining-car stewards for their recipe for French dressing and mayonnaise,

But he was familiar with Strauss-Dürckheim's brilliant treatise (1828) on the cockchafer and that earlier (1760) but equally brilliant monograph on the goat-moth caterpillar of P. Lyonnet's.

He was so unliterary that he never understood the difference between *Ibid.* and Anonymous,

But he spoke of 1842 as the year in which von Kolliker first described the formation of the blastoderm in the egg of the midge *Chironomus*.

Mr Suggs' speciality was fireflies, which he knew inside out and from stem to stern,

And he was on the track of why they blaze and don't burn,

And then one day he met a girl as fragrant as jessamine,

And he found her more fascinating than the rarest eleven-legged specimen,

But, being a diffident swain, he wished to learn how the land lay before burning his bridges,

So he bashfully asked her mother what she thought of his chances, and she encouragingly said, "At sight of you, my daughter lights up like a firefly," and Mr Suggs stammered, "Good gracious, what a strange place for a girl to light up!", and rapidly returned to his goat-moth caterpillars, blastoderms, and midges.

—OGDEN NASH.

[Reprinted from Ogden Nash's book, *Versus*, by kind permission of Messrs J. M. Dent & Sons, Ltd.]

MITES ON BEES

I was interested to read Henry R. Wallace's (318) remarks concerning mites on Humble Bees (*Bombus* spp.) in *Bulletin No. 108*, p. 92, as I have often found these insects struggling in their last throes and swarming with a species of buff-coloured mite about 1.2 mm. long. It is not likely the mites attacked the bees while

they were on the ground stunned, as they were found in paths in woods, fields, etc. The mites did not seem particularly localized or 'anchored,' but roamed quite freely, and quite quickly over thorax, wings, legs and abdomen, which latter was almost flat and empty in all cases.

PETER G. TAYLOR (719).

LEPIDOPTEROUS AIR-PATHS

I am glad that T. G. Howarth (1627) has brought this subject to light. For a long time now, I have been aware of a similar phenomenon amongst *Lepidoptera*, but thought it mere imagination.

The first instance I noticed was of the Brimstone Butterfly (*Gonepteryx rhamni*) which seems to follow one of several well-defined "paths" or routes, in our local woods. The principal path follows the bottom of a valley, steep on one side and gentle on the other, continues across an area of level ground and then, although the valley emerges from this (as a slight but definite depression) at the same point as both the route and a wide ride, the route itself continues parallel to the ride, and about 30 yards from it, diverging strongly from the valley-bottom, to meet it again 300-400 yards away over a slight bluff, after coinciding with the ride for 100 yards. The route now turns sharp right, along the floor of the "valley" once again, with woods to one side and open heath to the other. Throughout its length it seems hardly influenced by the vegetation, and has several sharp changes of direction.

I have noticed the phenomenon also markedly in the Orange Tip (*Euchloe cardamines*) and in the White Admiral (*Limenitis camilla*); almost as strongly in the Holly Blue (*Lycacnopsis argiolus*); and quite detectably in the Marbled White (*Melanargia galathea*). High Brown Fritillary (*Argynnis cydippe*). Green

Hairstreak (*Callophrys rubi*) and Purple Hairstreak (*Thecla queercus*).

PETER G. TAYLOR (719).

PUBLICATIONS RECEIVED

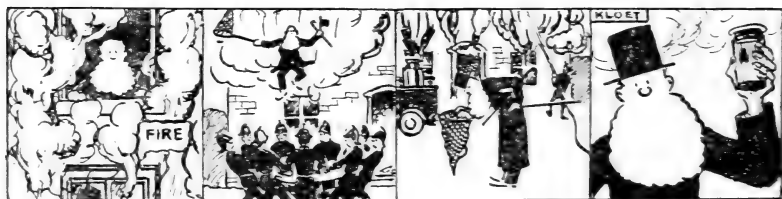
Marsh Gardens, by Ernest Richardson: Water Life Series, No. 7 (Second Edition), 1950; 1/6. Published by 'Water Life,' Stamford Street, London.

The first edition was called *The Bog Garden*. This new edition has been extensively revised and new drawings and photos included.

Taunton School Natural History Society, Annual Report, 1949. Sent by E. G. Neal (467), one of the Vice-Presidents and Chairman of the Senior Section. The report is most interesting and the area covered by the Society is most obviously a fruitful one in respect of Natural History items. There is, in addition to ornithological and botanical reports, a list of the 44 butterflies in the county, with notes—including a record of the Camberwell Beauty (*Nymphalis antiopa*), which does not appear to have been sent to Captain Dannreuther. The Entomological Report records the capture of the Great Silver Water Beetle (*Hydrous piceus*). The Society would probably find that affiliation to the AES would be helpful.

Five members spent a profitable week at Dale Fort Field Centre, of which a full account is given. Short abstracts of papers read at evening meetings and notes of field meetings complete the report.

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VOL. 9

No. 117

SEPTEMBER - 1950



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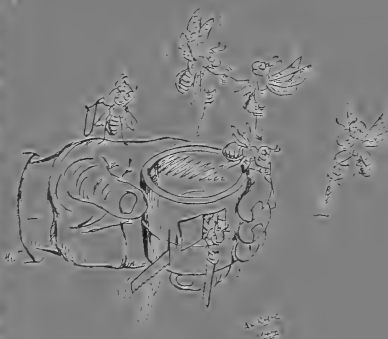
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No. 117

BULLETIN

SEPTEMBER 1950

EDITORIAL

The Presidential exposition of policy, under the heading 'Where are we going?' will be welcomed by all members—particularly the Editor. It enables enthusiastic members, who wish to see the steady improvement in the *Bulletin* maintained, to write that kind of article which will do this, and it enables the Editor to tell members, once again, that the *Bulletin* is their publication, written by themselves for themselves. He would like, ideally, a steady flow of articles throughout the year, but if members prefer to write up their results and send them in, in the winter, he will not complain. Moreover, he would remind members that the *Bulletin* is now the medium for those more technical articles which would previously have appeared in the *Journal*. It is, now, a year since he appealed for more 'copy.' More articles and more contributors are still required, and soon. The *Bulletin* is insatiable, and must be fed.

WHERE ARE WE GOING?

I believe it to be the duty of the man who has been honoured by election to the President's chair to reflect upon the aims and progress of the Society. How is the Amateur Entomologists' Society progressing? Where are we going?

There is no doubt about our vitality. We survived the world war: more, like a well-known theatre, we can boast that "we never closed." This we owe to the tenacity and keenness of a small band of members who wrote in odd corners of nissen huts or made beautiful line drawings in air raid shelters, not for the sake of gain, but because they lived up to the tradition which has made British amateur societies real contributors to the progress of science. Without them the enthusiasm of the rest of the membership would have had no focus and there would have been no *Bulletin* and no membership list for the maintenance of contacts.

British amateur societies are something of which we can be very proud. Their glory is that among their membership they invariably include a good many of the experts, the special-

ists with international reputations, the kindly professionals who, far from "having no use for the amateur dabbler," are always ready to guide, help or advise without condescension or indeed any feeling of it. The AES is no less lucky than others in this respect.

At the other end of the scale, we have lively young members, some of whom may turn out to be experts one day; a good many more may take up entomology as a career in the Home Country or some part of the Commonwealth. Most are probably just keen naturalists and will remain amateurs. We exist as a Society especially to meet their needs and encourage them. But the backbone of the Society is made up of the adults, the fathers and mothers, bachelor uncles and maiden aunts, science masters and biology mistresses, scout masters and Guiders, and the many ordinary folk who, like myself, turn to the study of living things as a buttress to sanity in a crazy world.

How can we cater for all these diversities of interest? The Editor is often taken gently to task for the contents of the *Bulletin*. Some say that so much is so childish that we cannot hope to keep our experts as members; others say that the articles are getting so scientific that the young members are finding them quite above their heads. Some say that the discussion on nomenclature is entirely out of place. Let us not confuse the beginner, but give commonly accepted English names for insects and use Latin names only when there isn't one. Only a small proportion of us make any sense of Latin. In the way of a rejoinder another member remarks that the attempt to ridicule scientific names is itself childish. If a naturalist cannot appreciate the need for accurate nomenclature, then he has not travelled very far with his studies. We have foreign members (and should like more) and the scientific name can be understood everywhere in the world. They can at least place an insect belonging to, say, the genus *Pararge*; but they may not see the connection between "The Wall" and "The Speckled Wood." All this controversy is good fun and leads to

lively exchanges. I have noticed that the Editor usually allows us to use both English and Latin names anyway!* But it is important that we should not give the junior members the impression that we elders waste our time (and theirs) in sterile controversies. One does not collect insects in the same way as one collects stamps. The collection should only be the end-product of a study of the living creatures and their relations with the rest of nature.

These contentions have, however, some serious aspects for the AES. It is perfectly true that when the level of *Bulletin* notes fell for a time, some senior members who were important to us did cease subscribing in disgust. I think their action was as premature as it was regrettable, and I should like to win them back. It is also true, as the Honorary Secretary reported to the AGM, that the proportion of junior to senior members has fallen. This defeats one of the major aims of the Society.

There are certain notions we ought to examine and dismiss. We are an "amateur" society: this does not imply we are unscientific. We print cartoons as well as illustrative figures: this does not reduce the *Bulletin* to the level of the weekly strips. Professional readers are known to turn to the *Bulletin* for a smile. We like to publish the observations of our junior members: this does not by any means imply that we are "childish." The naturalist correspondent in *The Times* of July 11th made the very wise statement that

"the most interesting — and most reliable — observations come from the under eighteens. Grown-ups are apt to be influenced by what they have read in books; their reports, too, often lack the freshness and spontaneity of youth's keen-eyed observation."

Another aspect of an amateur society is the emphasis it can give to practical things: the dodges and devices which arise spontaneously from collecting and breeding, observing and experimenting with living things. Many of these are as valuable to the professional as to the amateur, to the well-off as to the schoolboy with only

the sixpences earned from chores. The forthcoming *Journal* will be a mine of practical ideas.

Mr K. G. V. Smith (897) writes:— "We have a large membership and I think we would do well to organise research by team-work. Amateur ornithologists set us an example of such work in the various enquiries organised by the British Trust for Ornithology. In this way those of us with only a little time to devote to Entomology can do useful work by mutual effort. A recent topic in the *Bulletin* has been *Mites on large insects*. To take this as an example, if all members who encountered mites associated with other orders secured determinations of both host and mite, science would benefit not only by the light thrown on the distribution of mites, but no doubt the many other facts that would come to light. When helping ourselves we can nearly always help students of other subjects with just a little further effort. If we can start off investigations among our members under the auspices of a panel of research advisers, then we shall go a long way towards getting the amateur the recognition he deserves. I do not pretend that we can compete with professionals; indeed such should not be our aim. We could work with them in the solution of common problems."

I would like to support this idea and hope to have some suggestions from professionals. I have always hoped that we might have more simply-designed observation-cum-research from schools. This was my express idea in the note on 'Living Fast' in *Bulletin* 92.

The only things which can cast dark shadows over the AES are intolerance among the membership and the rising costs of publication. The first I have no fear of. The second is difficult. We want more junior members, because we exist primarily to meet their needs. But the reduced subscription for junior members does not really enable them to pay their way in the Society. So, for financial as well as less sordid reasons, we want more adult members. Can we each set ourselves the task of securing one new member at least for 1951? If we succeed, I am sure that we can be quite happy about where we are going.

W. J. B. CROUCH (1181).

(Note.—Subscriptions of new members joining after August 31st, 1950, cover the whole period till the end of 1951.—Ed.)

*Mr K. G. V. Smith (897) has drawn attention to T. H. Savory's excellent little book, *Latin and Greek for Biologists*, University of London Press, 2s 6d. He hopes that some scholar may contribute an article on the subject for the benefit of junior members—and others.

MISCELLANEOUS NOTES ON THE ANGLE SHADES

Partly, at any rate, because of their nocturnal habits. Noctuid moths seldom furnish really good opportunities for study of such interesting aspects of insect life as the pairing procedure and oviposition. If one can stay up until all hours (and the keen student must be prepared to do this if, for example, he has special study-subjects) without fear of oversleeping in the morning, well and good. If one is adept at crawling into bed long after the witching hour without disturbing the slumbering spouse (who has probably long since doused the glim) or innocent offspring, so much the better. To be painstaking as well as efficient in entomological pursuits it is desirable that one should be proficient in sundry non-related "arts" as well.

Off and on, over a period of several years, I have bred the Angle Shades (*Phlogophora meticulosa*) on a fair scale; but though I have on several occasions observed the initial stages, as it were, of preliminary courtship, I have not so far had the good fortune to witness an actual coupling. However, a few remarks concerning oviposition and other matters may be of interest.

Normally, I find, females deposit their eggs over a period of anything up to 7-8 days; but sometimes egg-laying covers a period of ten days or even more, especially in autumn. When *captured* females cease to oviposit within a day or two of capture it can, I think, be safely assumed that they have laid a proportion of their ova prior to capture, especially if the number of eggs laid in captivity proves rather small. However, the number of ova deposited varies considerably with individual females.

Invariably the egg-laden moths are so shy of human observation that some little ingenuity, plus a good deal of patience, becomes necessary if it is desired to watch the actual method of oviposition. Gravid females will "sit" for interminable periods on foodplants, will crouch against the side of the cage or hang from its roof (or from the muslin cover of the jar, according to the type of breeding receptacle in use), with eggs dotted all round them; and as a general rule the bulk of the egg-laying is accomplished during the hours of darkness, though, so far as I have been able to ascertain, it enters its most intensive phase before midnight (B.S.T.).

Dealing—say, in September—with adult females of the second generation (which naturally commence ovipositing at an earlier hour than in the late spring or early summer months), I find that a good plan is to keep them in a roomy, glass-fronted cage and *gradually* accustom them to a *dim* light (a bright one nearly always disconcerts them) from about 9 p.m. (B.S.T.) onwards. There is, of course, one drawback in that the dim light makes observation a little difficult until one gets used to it; but it does, at least, encourage the egg-laden moths to get on with their job.

I have found that, as stated in the paper on the life-history of the species by Parr and Speyer, referred to in previous notes regarding certain habits of the larvae (*Bull. No. 108*, pp. 93-94), and quoting Theobald (1927), the greater proportion of the eggs are laid singly. But sometimes clusters of two, three, or even more are extruded; and these latter frequently occur in solitary batches, whereas most of the single eggs are placed close against those already laid, thus adding to the "pattern." In captivity, oviposition is often haphazard, and sometimes curious patterns are followed. At the top of one of my cages is a long, narrow, horizontal strip of perforated zinc which had been insinuated between the cage roof and the frontal glass to close a slight gap. The cutting of this zinc left a row of small points where the small holes were bisected. One of my moths deposited a whole row of ova along these points, neatly affixing one egg to the tip of each. Later, she varied the pattern somewhat by adding further ova to those already deposited on the zinc tips, with the result that many of these eventually bore "strings" of three, four, or more eggs, the whole effect being decidedly quaint, almost uncanny.

Between 9 and 9.30 p.m. one evening in late September, I watched a moth ovipositing. Throughout the greater part of this egg-laying period, the wings vibrated rhythmically and continuously, the while the insect crept from leaf to leaf, depositing an egg on each but returning to each individual leaf time and time again. One impression gained is that wild female Angle Shades moths tend to "spread" their ova rather more than in captivity, but, as I have not yet found eggs in natural situations I cannot confirm this.

The female's body was well arched throughout its length, but—save when the eggs were deposited on the *under* sides of leaves—the arc made by the curving abdomen was never really acute. So far as I could see, the ovipositor, when

fully extended, protruded at least an eighth of an inch; when fully expanded, its extremity appeared wedge-like or funnel-shaped. I was lucky enough to get an excellent view of a cluster of several ova as they appeared at the end of the ovipositor.

Later, by way of experiment, I shone a bright light on the cage. Result: prompt cessation of oviposition; and though I waited and watched for a further quarter of an hour, no further eggs were deposited.

As often as not, even when fresh or growing pabula are supplied, a considerable proportion of the adhesive eggs are laid on the cover or roof, or on other parts, of the breeding receptacle: which renders the hatching process quite easy to observe. Normally, the egg (which has been described by Parr and Speyer) hatches in about ten days, but the autumn-winter life-history stages are more protracted than those in spring-summer. The hatching period is remarkably constant whether the insects are kept out-of-doors (in the shade) or indoors (in a tolerably cool room).

The eggs, I find, usually darken a day or two before hatching, and subsequently tend to become somewhat elongate or "taller." At first, the tiny larvae swing on silken threads. They are nocturnal feeders, seeking seclusion during the day. Incidentally, it is to be noted that pupation is usually preceded by a prepupal period which appears to vary considerably, though in some instances, e.g. in late winter, normal wild larvae on being taken into a moderately cool room have pupated almost immediately, the metamorphosis being accomplished in something like record time. These were found in such hiding-places as the rotten wood of a gate and in other decaying wood and similar debris in the vicinity of the house. It could therefore, I think, be assumed that when captured they were hibernating rather than entering into or preparing for the prepupal condition, since *meticulosa* larvae usually pupate in (shallowly), on, or near the ground; though I have noted exceptions to this rule, for the Angle Shades is nothing if not adaptable.

Matters arising, whether directly or incidentally, out of research regarding larval colour-forms, will be dealt with in subsequent notes. Meanwhile, the following life-cycle data in respect of representative breeding experiments are offered:—

1. *Late Spring-Summer*—eggs laid June 16th-17th (1946); hatched, 26th-27th (parents having been released June 18th).
Time taken to hatch: 10 days. Larvae full-fed in 4-6 weeks (individuals varied considerably). In pupa about one month; pre-pupal + pupal, say, up to 5 weeks. First moths emerged August 22nd, last out September 13th (only two pupae out of a considerable batch failed). Total period, egg-laying to emergence of imagines: varying from approx. 9½-12½ weeks.
Pupal Emergence data:—Morning, 3%; afternoon, 9%; by day (time not known), 9%; evening (8-10.30 p.m. B.S.T.), 33%; night (i.e., after 10.30 p.m.), 30%; not known, 16%.
Life of adult moths not recorded.
2. *Late Spring-Early Autumn*—eggs laid June 17th (1946); hatched, 28th.
Eggs hatched in 11 days; other stages much the same as in (1). First imagines out August 22nd. There were 85 emergences—some of them during the second half of September—with few failures; as before, most of the moths emerged during night or evening. One of the imagines resulting lived 34-38 days, two others about 30 days: it will be seen that the adult is quite long-lived.
3. *Autumn-Spring* (1946-1947)—eggs laid from October 4th to 12th; hatched, from 20th-21st onwards, majority by 26th. Hatching period: up to 16 days, as against 10 days in summer. Some caterpillars were still feeding quite strongly in December, others spasmodically or not at all. Some failed to survive, but unfortunately a number escaped. One larva, which had made a web, thickened with chips of paper, on following March 23rd (1947), was seen to have completed metamorphosis by March 28th: a cripple emerged on May 6th, dying shortly afterwards. The diapause seems to be the critical phase with breeding stocks of this species during the colder months of the year.
4. *Winter-Spring*. A wild larva of the bright yellowish-green form, captured in February 1950, pupated shortly after being placed indoors, and a normal moth emerged on April 22nd. It lived until the afternoon of May 12th, i.e. about 3 weeks.

Light does not appear to hold much attraction for *P. meticulousa*, though I have captured the species by this means; but it comes readily to "sugar" and, in my experience, to traps baited with dilute fruit-juice mixtures. (Such traps often take moths when "sugar" fails.) Adult moths can sometimes be spotted on tree trunks and fences, etc., often low down, but they are not easy to pick out unless one searches closely. One of my breeding females literally gave herself up: I strolled in from the garden one night at dusk and found her perched on my shoulder! Though often abundant, the species has its lean spells, at any rate in my district.

Prospective breeders should note that a considerable period may elapse before bred females oviposit.

PETER MICHAEL (748).

REFERENCES:—

PARR, W. J., and SPEYER, E. R. (1941). Some observations on the life history of the Angle Shades Moth (*Bratolomia meticulousa* L.) *Ann. Appl. Biol.* 28 (1), 29-33 t.3.

THEOBOLD, F. V. (1927) *Journ. S.E. Agric. Coll., Wye*, No. 24, 44.

THE ANGLE SHADES MOTH IN DECEMBER

On the morning of December 28th, 1949, I was rather surprised to find a newly-emerged specimen of *Phlogophora meticulousa* drying its wings on a curbstone in the streets of Ogmore Vale, Glam. I soon located the empty pupa case a few inches away, lodged between that curbstone and the next. The moth was a perfectly normal female as regards size, colour pattern, etc.

At about 10.0 p.m. the same evening I took another fresh example of this species, another female, flying around a lamp standard only a few yards from the spot where I had found the first specimen. I also saw a third Noctuid moth flying around the light, and this was no doubt of the same species.

The abnormally mild weather of the preceding week, when temperatures rose to above 55° F., was, of course, responsible. My latest record for the species beforehand was of a fresh male taken on a window-pane on November 22nd, 1946. This was also during a mild spell.

TERENCE PARSONS (1513).

MOSQUITOES—A SUGGESTION

While travelling on top of a 'bus in Leeds this August, I was puzzled by the frequency of great curtains and columns of "smoke" hanging around corners of houses and trees. When, at last, I realised that the "smoke" was really composed of millions of mosquitoes performing their courtship dance, I was impressed with the possibilities offered for nuisance control.

The existing methods of mosquito control in this country are surely very unscientific. They depend, for their effectiveness, on their generalisation of application, yet they are sold to individual members of the public for application on their own premises. Surely, from their very nature, the breeding-places of mosquitoes are likely to be more frequent on premises which are neglected through the apathy, ignorance or lack of means of those responsible for them. Thus, those who do take the trouble to use the present measures, will soon be discouraged by the influx of mosquitoes "from next-door."

The control of mosquitoes seems, then, to be a job for a local authority, say the sanitary officer, and as it would obviously be inconvenient for the present methods to be applied by this medium, I suggest that some enterprising local body might set an example by instituting a service comprising a squad of men equipped with a powerful atomizer for attacking the clouds of dancing mosquitoes. The spray would not be blown away, as these dances seem to occur only on calm, windless evenings, and a cloud of it would soon annihilate a complete swarm, many of which could be "done" in a single evening.

I should like to hear from anyone else who has any ideas on this subject.

PETER G. TAYLOR (719).

Quite apart from the fact that "neglected premises" do not necessarily harbour more mosquitoes than others, and leaving aside the question that the commonest 'domestic' mosquito (*Culex pipiens* L.) is a species which does not 'bite' man, the main

part of Mr Taylor's article is thoroughly fallacious. It is, however, quite true to say, as Mr Taylor does, that the swarming of mosquitoes is, in essence, a 'courtship dance'—but what is omitted is of vital importance from the point of view of control. It is, of course, the *female* which lays the eggs to perpetuate the race, it is also the *female* which punctures (the male is not equipped with blood-sucking mouthparts), and it is, therefore, the *female* at which control methods must be aimed. Unfortunately it is the *male* that swarms. The female only enters the swarm of males singly and immediately becomes locked with one of the myriad males; they immediately fall together and pair on the ground, or on nearby foliage.

I am afraid that any local authority which undertook the annihilation of these swarms would only be wasting money.

Most Sanitary Inspectors and Medical Officers of Health are well informed on the question of mosquito control, which is usually tackled on a modern and scientific basis—usually by destruction of the early stages in the breeding places, or by the destruction of the breeding places themselves where practicable.

E. W. CLASSEY (41).

REVIEW

Handbooks for the identification of British Insects. Vol. IX, part 2. *Diptera*, 2. *Nematocera*, families *Tipulidae* to *Chironomidae*. By R. L. Coe, Paul Freeman and P. F. Mattingly, Royal Entomological Society of London. May 1950. Pps. 216: 199 text figs. Price 20/-.

The British *Diptera*, in general, are the poorest served among the major groups of the Insecta in the matter of literature.

With the exception of J. F. Marshall's *The British Mosquitoes*, 1938, and Edwards, Oldroyd and Smart's *British Bloodsucking Flies*, 1939, practically the whole of the published literature on the *Diptera* is, to-day, very difficult to obtain and costly.

The Royal Entomological Society of London has undertaken a praiseworthy task in attempting to cover the whole of the British Insects in their "Handbooks" but it is fairly safe to say that there will be none more welcome, or so sorely needed, as those on the *Diptera*.

The names of the authors of this part are a sufficient guaranty of pains-

taking excellence and the Royal Entomological Society's Editor (himself a Dipterist) has been singularly fortunate in being able to recruit the services of Messrs Coe, Freeman and Mattingly.

This book is very well printed and the type is clear and easy on the eyes; the black and white illustrations also are of a very high standard.

Particularly welcome are the notes on distribution and bionomics incorporated in the Keys; these show a very welcome imaginativeness and a genuine concern to cater for the informed amateur.

Some of the Keys have been tested and have proved simple and thoroughly reliable. It is not possible to try them all—for obvious reasons—but it is worth comment that especial care appears to have been taken with those species which are very close and notoriously difficult to tell apart—e.g. p. 110, *Aedes annulipes* Meigen and *Aedes cantans* Meigen, and pp. 111-12, *Culex pipiens* L. and *Culex molestus* Forskål.

Whilst on the subject of Keys, it would be as well to mention that Vol. I, part 1, of this series of Handbooks (General Introduction) has not yet been published. It is to be hoped that the issue of this part will not be long delayed and that the opportunity will be taken to include therein a Guide to the Use of Keys. For those who are not specialists, or professional entomologists, a Key is often a nightmare and, like recurrent nightmares, is resolved once the simple facts are explained.

Another plea for the amateur:—In future parts would it not be possible to add an appendix of the full names of publications mentioned in the references to literature? The amateur is, I am sure, sorely puzzled by references to *Korr.-bl.*, *Naturf.-Ver.*, *Riga* or *Vidensk. Medd. Dansk. Naturh. Foren.*—though this be all as clear as day to the professional or to the worker in the Natural History Museum, who only has to pop over the road to the Royal Ent. Soc. to have the obscure publication smartly produced!

Other small criticisms might be made, none of them as important to the amateur as the above, but the general excellence of this very important publication almost makes minor complaints seem silly.

It is very certain that many more entomologists will be persuaded to take up *Diptera* now that they have

a solid basis for their studies; many must have been dissuaded from collecting this Order because no literature such as this existed.

Anyone using this part should make a point of obtaining, in addition, Vol. IX, part 1 (Diptera: Introduction and Key to Families), July 1949, price 7/6, as it contains notes on technical terms and the structure and classification of the *Diptera* in general, in addition to the Keys to the Families.

E. W. CLASSEY (41).

Note:—The AES is about to assist in the study of Diptera by publishing a Leaflet on "Collecting Flies" (Diptera).—Ed.

●
COLIAS ALFACARIENSIS Ribbe*

The above butterfly has been called Berger's Clouded Yellow, in the *Entomologist*, 82: 71 (1949). It might with equal justification, have been called 'Fontaine's Clouded Yellow,' or, possibly, 'Ribbe's Clouded Yellow.' Still, 'Berger's Clouded Yellow' has already been published

*According to The Entomologist's Gazette, Vol. 1, No. 3, published while this note was in the press, the agreed name of this butterfly now is *Colias australis* Verity.—Ed.

as the English name, so this name must, presumably, be used. Members have asked for an account of the differences between the Pale Clouded Yellow (*C. hyale*) and Berger's Clouded Yellow. It must be emphasised that the following notes are no more than extracts from the papers noted and that the scientific status of *C. alfacariensis* is still a matter of research and maybe controversy.

In *Lambillionea*, 47: 91 (1947), and 48: 12, 21 and 90 (1948), there was published a paper 'Une espèce méconnue du genre *Colias* F.' by A. L. Berger and M. Fontaine. This paper gives a short history of how the possibility of there being two distinct species arose. Dr Fontaine wrote that the *Colias* regularly observed each year in the Entre-Sambre-et-Meuse, notably at Nîmes, was Dr Verity's *C. hyale* race *calida* and was confined to this river basin. The habits of the species and its 'race' differed, as *hyale* preferred clover and lucerne fields while the '*calida*' was only found on calcareous and sterile slopes. A most important fact also was that the Horseshoe Vetch (*Hippocrepis comosa* L.) was *calida*'s sole foodplant. Dr Fontaine asked whether it was not possible

TABLE OF COMPARISONS.

	Pale Clouded Yellow (<i>C. hyale</i>)	Berger's Clouded Yellow (<i>nov. sp.</i>)
Size.	Quite variable.	More constant.
Colour, upper side.	Generally pale sulphur yellow in the male and white or yellow- or green-tinged in the female.	Often deep yellow in the male and pure white in the female. Yellowish forms rarer than in <i>hyale</i> .
Black Markings, upper-side.	Forewings:—Border variable in width and in the number and extent of the submarginal light patches. Hindwings: — Generally sharp marginal border often with a submarginal border of ill-defined black markings. Blackish dusting at base more extensive than in <i>nov. sp.</i>	Forewings:—Border generally narrower than in <i>hyale</i> , inner edge more sharply defined. Hindwings:—Marginal border less pronounced than in <i>hyale</i> often broken up into small separate markings.
Orange Spot on hindwings.	Generally two, of pale yellowish-orange and small size. The upper spot can be missing.	Almost always of a clear bright orange, two in number, large and generally confluent.
Outer margin of hindwings.	Generally straight, but convex in about 15% of the cases.	Nearly always markedly convex; straight in only 3-4% of the cases.
Pink colour of fringes, neck, antennae and legs.	Less marked, and paler than in <i>nov. sp.</i>	Often bright in colour.

that instead of being two *species* they were *two good species*. However, Dr Fontaine, with M. Debanche, of Louvain, could show no difference between the genitalia of *C. hyale* and race *calida*. Monsieur Lucien A. Berger's opinion on the duality of the group, when consulted by Dr Fontaine, was similar; though his opinion was based on geographical distribution over Europe as well as on arguments based on anatomy.

In comparing the characters of the two types, Dr Fontaine refers throughout to *C. hyale* and *nov. sp.*—the latter being what M. Berger has called *C. alfacariensis* Ribbe. The table overleaf gives some of these comparisons. Dr Fontaine thinks the most important differences are in the black markings on the upper sides (particularly the hindwings) and the orange spot on the hindwings.

These more important differences in the imagines are accompanied by a distinct larval difference (if larvae should happen to be obtained). The caterpillar of the *nov. sp.*, whichever generation it may be (spring, summer or autumn), has in its later instars (4th stadium onwards) well marked dark patches, both subdorsal and dorsal, which are lacking entirely in *C. hyale* larvae. The *C. hyale* full grown larva might easily be confused with that of *C. croceus*. The *nov. sp.* larva however has, in addition to these dark patches, four yellow lines placed subdorsally.

Monsieur Berger has also published a note in the *Entomologist*, 81: 129 (1948), called 'A *Colias* New to Britain (*Lep. Pieridae*)' in which he calls attention to the fact that the *nov. sp.* is much faster and wilder on the wing than *C. hyale*. He makes the interesting assertion that Plate 21 in South's *British Butterflies* figures the new species and figures 3-5 on Plate 26 of Ford's *Butterflies* represent true *hyale*.

T. T.

ITINERANT APIARISTS OF AUSTRALIA

The Australian apiarist, according to Eric Rowell on Radio Australia (reported in the monthly review *Australia*), must be an all-round man—"naturalist, generally useful, and motor mechanic." For bee-keepers in Australia are "a migratory tribe" seeking, over thousands of miles of

countryside, the flowers from which the bees gather the harvest that may bring the itinerant apiarist well over £1000 a year.

New South Wales alone has some 4000 bee-keepers, of whom approximately 75 per cent. produce honey commercially. The migrant apiarists take their bees with them. One party, which covered 2400 miles from Molong, N.S.W., to the Warren district of Western Australia, took with them 1800 hives and "an army of bees estimated at 20 millions." Object was to gather 300 tons of honey.

These apiarists travelled in comfort, their roomy caravans being equipped with water, light, refrigeration, built-in stoves and other modern conveniences. The Queen bees and their retinue likewise travelled in regal style, mostly by night to avoid the heat of the day.

Reason for the Australian apiarist's migratory habits? Primarily, the fact that "the eucalypts blossom in cycles and each tree blossoms every two years. The trees in one district will be in blossom in one year, those in another district in the following year."

Other coveted flowers are those of yellow box (which in New South Wales is generally considered to give the best honey), red gum (Victoria), blue gum (South Australia), and the fragrant karri (Western Australia). But the most distinctive honey of all—in fact, according to Tasmanians the best in the world—is that derived from the leatherwood tree.

Australia's export trade in honey, said the broadcaster, though only twelve years old, has become a £1,000,000-a-year industry, a "tremendous fillip" having been given to it by the war.

PETER MICHAEL (748).

[For the benefit of English readers, the following key to the plants mentioned may be given:—

Yellow box=*Eucalyptus melliodorus* A. Cunn.

Red gum=*E. tereticornis* Sm. and *E. rostrata* Schlecht.

Blue gum=*E. globulus* Labill.

Karri=*E. diversicolor* F. Muell.

Leatherwood=*Eucryphia lucida* (Labill.) Baill. or *Acradenia Frankliniae* Kipp.

—H. K. A. S.]

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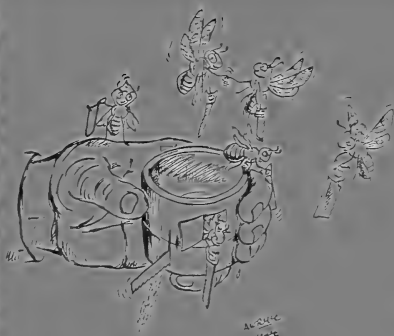
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NOTES ON COLLECTING IN THE
HIGHLANDS

I was at Dalwhinnie (Inverness-shire) from July 8th to 24th, 1950, and though the weather was unfavourable and the results poor, a few notes on my experiences may not be without interest. Dalwhinnie is 1200 ft. up in the wide valley of the Truim, at the head of Loch Ericht. On both sides of the valley stretches of moor and moss run up to hills between 2000 and 3000 ft. high, from which many small streams descend to join the Truim. The whole region is treeless except for a fir plantation at the head of Loch Ericht and a few trees in the village.

During the first week there was continuous high wind and heavy rainstorms; the second week was much better, with a fair amount of sun, but no day was quite free from rain, and the wind was always strong, so that, for day collecting, sheltered slopes and gorges of streams had to be sought. There was not one "butterfly day," and the 8 Large Heaths (*Coenonympha tullia* var. *scotica*) I managed to scrape together were taken in twos and threes in bright intervals, or kicked up. One day, when it had poured with rain all the morning and then, in the early afternoon, the sun shone out hot and strong, I went to the ground on the banks of the Allt Coire stream where I had already taken the insect, but found nothing flying; the butterflies would not leave the drenched herbage. I did kick up one Large and two Small Heaths (the Small Heath, *C. pamphilus*, was the only other butterfly to be seen on the mosses).

On some days the only form of collecting possible was searching posts along the road and fences and walls in the village. These posts began well by yielding a Scarce Silver Y (*Plusia interrogationis*), but after that only a few common noctuae; on the fences and walls I found 2 Treble Bar (*Anaitis plagiata*) and one Grass Rivulet (*Perizoma albulata*).

On the open moors an occasional Geometer might be distributed, or a Wood Tiger (*Parasemia plantaginis*)

seen bowling along; but the chief haunt of the geometers was the thick heather on the banks of the streams and in the gorges. Whenever thick heather projected in an "overhang" from a low cliff above a stream, the Grey Mountain Carpet (*Entephria caesiata*) would fly out if disturbed—sometimes several at a time—and make off down wind, sometimes rising to a great height. At any rate, they generally put themselves out of immediate danger by crossing the stream to a new lurking place. The ideal way to catch this insect would have been to have one person high up on each side of the stream, both with nets. Some of your readers may say "what a to-do about catching a moth which will come in numbers to a lamp and sheet, or which can be found quite easily by searching rocks and walls!" To which I would reply that I had no lamp and sheet (which in any case would not have been effective till towards midnight) and that there are no rocks and walls on these moorlands. These *caesiata* were often a fine dark form, and very fresh. The Red Carpet (*Xanthorhoe munitata*) was to be found in similar places, but it was much less numerous and not in the best condition. The Small Argent and Sable (*Epirrhoë tristata*) was common rather locally in patches of thick heather and, with its weaker flight, much easier to catch. The Narrow-winged Pug (*Eupithecia nanata*) flew towards 7 p.m., but was at other times not readily disturbed; I found it most commonly by Loch Ericht. A few Pretty Pinion (*Perizoma blandiata*) and Purple Bar (*Lyncometra ocellata*) were to be had.

I only got in four nights' sugaring (very late so far north, with Summer Time). The wind was always southerly, but on some nights rather strong, and the air was chilly: the attendance of moths was mediocre and the quality undistinguished. The 13 species seen did not include any of the regular Scottish noctuae; for some, of course, the date was too late, for others the ground too treeless. The capture of two Green Arches

(*Anaplectoides prasina*) was interesting, as South (1939) does not record this moth from the Highlands except from Perthshire (authority Barrett). By far the most numerous moth at sugar was the Dark Arches (*Xylophasia monoglypha*), whose dark forms, running to coal black with practically no wing markings, command respect: next came the Middle-Barred Minor (*Procus fasciuncula*), Small Square-spot (*Diarsia rubi*) and Double Dart (*Graphiphora augur*); the others were only in ones and twos. I was unable to get to the more distant fences on which in past years the Northern Arches (*Apamea exulis*) has been taken; but I see no reason why this strong-winged insect should not have come to my posts if I had had a few days longer and warmer nights.

The Small Dotted Buff (*Petilimna minima*) was flying at dusk in long grass and rushes on the banks of the Truim.

There were no trees for larva beating, and an attempt a few miles up the valley was unprofitable: in any case, it was usually too windy. The only larvae found were of the Oak Eggar (*Lasiocampa quercus* var. *calunae*), Emperor (*Saturnia pavonia*), and one, now pupated, which I take to be the Red Swordgrass (*Xylina vetusta*).

I was also at Oban for a week, but was not collecting regularly. I found larvae of the Powdered Quaker (*Orthosia gracilis*) abundantly on bog myrtle, and was lucky enough to take one Foothill Burnet (*Zygaena achilleae*). Had I not known I was in *achilleae* country I should have passed the insect by (it was a poorish specimen) as a shabby Six-spot. When I set it I found it had a deep blue body.

F. H. LYON (1026).

P.S.—Since writing the above I have seen in an old collection at Wellington (Som.) a specimen of the Green Arches labelled "Forres." This shows how far collecting outruns recording and how the task of the text-book writer is handicapped thereby.

A SURVIVAL FACTOR

With reference to the recent notes about insects and cars, Maier and Schmerla (*Animal Psychology*, 1935) quote a case of a dragonfly laying eggs on a freshly-tarred roof, and use

it to illustrate the point that a dragonfly does not lay eggs in the water "... so that they develop," but does so when she is physically able to, and is stimulated by a shining surface.

Up till modern times the problem has probably not arisen, but now that man provides alternative shining surfaces those individuals who can distinguish the two would have a selective advantage, as their eggs have a much better chance of hatching. Evolution is a slow process, so I fear no present members of the Society will witness the climax of this adaptation, but a future member may look back in the archives and see that the twentieth century members were clever enough to foresee the possibility of a phenomenon he may know as a fact!

C. D. PUTNAM (1383).

[Note:—It would be interesting if some statistically-minded member would work out how long it would take for practical elimination of this fatal 'dry' ovipositing habit, presuming that only a small percentage of the population was incapable of distinguishing a dry shining surface from a wet one, and this percentage guessed wrong in 50% of the cases. The time might not be so long as Mr Putnam postulates. Old motorists would probably agree that road-crossing chickens are much reduced in numbers.—Ed.]

DOUBLE MATING OF EYED HAWK MOTHS

On the 8th June 1950 I enclosed a pair of newly-emerged Eyed Hawks in a cage, and didn't see them again until I returned from London on the evening of the 10th. At 9 p.m. on that evening the moths were *in cop.*: but the female had already laid about 250 eggs, which is, I believe, the usual quantity. These eggs hatched on June 21st. Is it usual for moths to mate a second time after ovipositing? If so, whatever its aesthetic advantages, it would seem to be a work of supererogation from Nature's point of view—and she is not much given to such works!

JOHN MOORE (146).

REFERENCE the News Item in *Bulletin No. 116*, p. 74, the Editor is informed that Mr Paul H. Holloway has now resigned from the Trusteeship of the Camilla Natural History Circle.

PRIVET AS A FOODPLANT

R. W. J. UFFEN (1660*), writing from Stamford Brook, London W.6, on June 18th, 1950, reports finding larvae of the Brindled Beauty (*Lycia hirtaria*) in his garden on apple trees, one on a pear tree, one on a fence above a bramble and several on a privet hedge. The latter food-plant surprised him. He noticed that a cooking apple was avoided, probably because of its rather tough leaves. (According to Allan's Larval Foodplants, the Brindled Beauty larva "has been found on almost every species of native and naturalized tree and shrub."—Ed.)

M. F. TAYLOR (1725*) recalls that he has found the larva of the Grey Dagger (*Apatele psi*) on privet. The larva died and he wonders whether privet is a usual foodplant, as no foodplant for this caterpillar is given in South. (Allan, in Larval Foodplants, gives the idea that *A. psi* is a fairly general feeder, hawthorn, blackthorn, plum, apple, and pear being the most usual. Privet is not mentioned.—Ed.)

H. G. BENNING (1427), of Newport, Mon., writes:—"On July 11th, 1950, at 2 p.m., while waiting for a 'bus I noticed a fine Humming Bird Hawk Moth flitting around a closely-clipped privet hedge. As there was no flower there I crossed over to watch. To my surprise, I found that it was a female and laying eggs. It hovered over a leaf and, turning its body inwards, it was depositing an egg on a leaf. It chose only the new shoots about 1 inch long with new leaves from $\frac{1}{4}$ to $\frac{1}{2}$ inch long and one egg to a leaf. I secured three eggs in the short time I was there, but mean to keep an eye on the hedge and find out if privet is a good pabulum. On July 12th, at 6 p.m., I saw a specimen feeding on a fine *Buddleja*. It looked like the same specimen."

REPORT OF AES FIELD MEETING HELD AT SHAWFORD DOWNS, HAMPSHIRE, ON JULY 16th, 1950

Leader: PAUL H. HOLLOWAY (429).

A day of intermittent sun and heavy showers with a blustering S.W. wind sweeping the downs made collecting difficult, but we were fortunate enough to find several species of butterflies on the chalky slopes and on the masses of *Buddleja* growing wild at the foot of the downs on the sheltered East side. At 2 p.m. six

members and one visitor set forth and the following observations were made:—

Melanargia galathea and *Maniola jurtina* were the most abundant species.

Lysandra coridon and *Maniola tithonus* made first appearances, a few males of each.

Plebejus argus, *Coenonympha pamphilus*, *Thymelicus sylvestris* and *Ochlodes venata* appeared sparingly.

Cupido minimus, one only, very fresh. *Vanessa atalanta* and *V. cardui*, *Pieris rapae* and *Aglaia urticae*; one of each.

A few of each of the following moths were observed: *Euphyia bilineata*, *Ortholitha chenopodiata*, *Zygaena filipendulae* and *Z. trifolii*, *Plusia gamma*, and one *Macroglossum stelarum*.

Belastium mites seen on *M. jurtina* only; larvae of *Callimorpha jacobaeae* stripping Ragwort.

The tea and discussion that followed in the picturesque setting of Fisher's Pond Café were thoroughly enjoyed by all present.

TIME OF EMERGENCE FROM PUPAE

I should like to add a personal experience to the most interesting article by Mr L. S. Beaufoy (628), in *Bulletin No. 110*, p. 15, on the time of day at which Lepidoptera emerge.

On May 23rd this year I secured a web of Lackey larvae (*Malacosoma neustria*) feeding on sloe. They were transferred to a breeding cage and fed on apple.

From July 1st to 7th, inclusive, nine males and thirty females emerged, the remaining cocoons then being placed outside as sufficient imagines had been obtained.

The point of interest is that every emergence occurred between 3.30 and 5.30 p.m., G.M.T.

PAUL H. HOLLOWAY (429).

A MOMENT'S REFLECTION

During the "off season" months I find it a good plan to go very carefully through all my cabinet drawers: there is more to do than one would at first imagine. Both sides of the lift-off glass frames are usually found to need cleaning, and this year, for the first time, I have found that "Windolene," as used for

ordinary household windows, has made a considerable improvement. Then there is the "paradichlorobenzene," or whatever is your fancy, to be added. Greasy specimens should be either discarded or cleaned in trichlorethylene or some other solvent. Some specimens may need re-setting. Other points which may have been missed in the busy times of the year will often come to light. In July of 1949, for instance, I caught a fine specimen of the Garden Carpet, *Xanthorhoe fluctuata* ab. *costovata*, as illustrated in South's *Moths of the British Isles*, Plate 61. Yet I have to confess that I only recently noted that my specimen, a little on the small side, was a female. "A moment's reflection" and I might have reared a whole row of this most interesting form.

P. J. GENT (192).

ABSTRACT

The Essex Beekeepers' Association *Year Book* for 1950 (1/-) contains their 8th Honey Harvest Report, compiled by H. C. Mills (1228), who is President of the Chelmsford Division. During June and July 1949 over 300 hours of sunshine were recorded and rainfall for the twelve months ending September 30th was only 15.3 inches, compared with the average of 21.26 inches for the previous seven years.

The mild autumn and winter meant that bees were flying frequently and stores got low. Those beekeepers who fed judiciously from February onwards were rewarded. The season was a great improvement on 1948, with an average yield per colony, for the county, of 31.12 lbs. Poorest yields were in those areas with lowest rainfall records.

The chief sources of nectar were, in order of importance, Fruit Blossom, Lime, Blackberry, White Clover, Hawthorn, and 2nd cut Red Clover.

The number of swarms was smaller than usual. Wasps were more numerous than usual, but the guard bees were able to drive them off. Losses from poison, particularly arsenical sprays, were again serious. An interesting observation on the ability of a colony to deal with wax moth, if not too numerous, was made at Slebbing, where two bees were seen to be carrying a large wax moth larva out of the hive—one holding each end.

In addition to the Honey Harvest report there are numerous articles and interesting items, divisional reports, etc.

OBITUARY

The death of W. T. MELLOWES, M.B.E., LL.B., F.S.A. (302), last April, removes a prominent figure from the civic life of Peterborough and a faithful member of the AES. It seems to be more than a coincidence that amateur entomologists are so frequently noted also for devoted public service. The late W. T. Mellowes is an outstanding example of this relation. If he had lived, he would have been made an honorary Freeman of the city in May last. He was widely known as an archivist and historian of the City and Cathedral of Peterborough, and had published several volumes about the history of Peterborough. He was honorary Chapter Clerk, President of the Peterborough Historical Association, and Chairman of the Trustees of the Peterborough Museum.

He was a keen collector of Macrolepidoptera, and well known to many members of the South London Entomological Society. He often attended the annual "Verrall Dinner." He was a member of the Nature Preservation Society and actively helped to get Castor Hoaglands—a noted local wood—placed on the list of nature reserves. His genial personality and very generous nature endeared him to a wide circle of friends, by whom he will be sadly missed. Men of his ability and worth can ill be spared.

AES EXHIBITION, 1950

This exhibition was very poorly attended by members; maybe the late alteration of the date had something to do with it; the fine weather and holidays certainly took a number of members out of London, instead of in to the Exhibition.

The lectures by Mr Syms and Mr Collins were much appreciated. The *Daily Mail* School Aid kindly loaned some excellent photos. of butterflies by Mr S. Beaufoy (627).

By the kindness of Dr E. A. Cockayne, a drawer of interesting varieties from the Tring Collection was on show and caterpillars of different species, live imagines of silk moths and an exhibit of the fauna of a grass tuft were other items noted.

It is to be hoped that, if there is an Exhibition next year, members will show a little less lassitude and rouse themselves from selfish sloth to active help and generous participation.

A NOTE ON THE SILVER CLOUD (*XYLOMYGES CONSPICILLARIS* L.)

In 1945 I suggested in the *Bulletin* (Vol. 6, p. 76) that this interesting Noctuid was not so rare as the books made out,—e.g. South says that "Specimens have occasionally been found at rest on isolated tree trunks or on posts, but *very rarely captured in any other way* . . . Perhaps most of the specimens in collections, *not numerous altogether*, have been reared from eggs . . ." (My italics). But this does not seem to be the case in Gloucestershire and Worcester-shire. Just before the war my friend, the late Dr O. H. Wild of Cheltenham, found it in his garden there, and only last spring Mrs Wild sent me a female, unfortunately infertile, which she had taken at the same spot. Dr Wild also found several specimens in 1938 and 1939 on palings near Malvern; he bred 50 imagines from one of his females. This is particularly interesting because Tutt in his *Practical Hints* (II, 32) records that a Mr Fox on April 20th, 1896, took a beautiful specimen of *X. conspicillaris* at Castle Moreton "whilst feeding on plum-blossom." Entomology as she is wrote! The moth, not Mr Fox, was feeding on plum-blossom; and doing so within 2 miles of the spot where Dr Wild found his female. Then in 1945 I obtained three moths from unidentified pupae which I had dug in the previous autumn under an elm-tree at Tewkesbury, Glos. It has also been recorded, in the same district, from Gloucester, Barnwood and Churchdown, and from Symonds Yat and Monmouth. All these specimens, except one from Monmouth, were referred to ab. *melaleuca* View.

On May 23rd and 24th, 1950, four worn males came to a light trap in my garden at Kemerton, Worcs. (two on each night). I have not seen any record of the moth coming to light, and the occurrence of four specimens in a trap which is neither powerful nor well-sited suggests that there may be plenty of *conspicillaris* in the area.

There seems to be no certainty about its natural foodplant, and I am told the larva has not been found in a wild state—which, if true, is surprising. Dr Wild's brood was fed, I think, on *Lotus corniculatus*, and P. B. M. Allan gives in addition *Trifolium dubium*, *Plantago major*, *Polygonum aviculare* and, doubtfully, *Prunus spinosa*. The pupae, however, have generally been dug from the foot of oaks and elms and it seems to me faintly possible that the

caterpillar may feed high up on one or both of these trees, which would account for its not being found by searching or beating. Chickweed was the only possible foodplant I could find in the area where I dug my pupae, apart from the elm itself. None of the recorded foodplants grew within sight.

It is rather curious that so little is known about so conspicuous and unmistakable a Noctuid; and in this part of England at any rate it would certainly repay search and study.

JOHN MOORE (146).

INSECT ORDERS

(Continued from Vol. 8, page 66)

Order VIII

EMBIOPTERA

This is a very small order containing barely 60 world species, mostly tropical, though three species are found in south Europe. They are smallish, dull-coloured insects which may be either solitary or gregarious. The females are wingless and the males are often attracted to light.

These insects live in a silken tunnel, which they construct under bark, beneath stones, etc. They shun the light and like moisture. They feed on vegetable refuse and are possibly carnivorous as well, as the mouthparts are similar to those of the *Orthoptera*.

The nymphs are similar to the adults and undergo no true metamorphosis.

(To be continued.)

BRIAN O. C. GARDINER (225).

HISTORY OF THE SOCIETY FOR BRITISH ENTOMOLOGY

By S. C. S. BROWN, Hon. Sec.,
Society for British Entomology

The Society for British Entomology was never planned, but it progressed from a small local Society to one of national scope by a simple series of adjustments made to meet demands which were found to exist.

The Society originated in the summer of 1920 when three Southampton entomologists met in the field and deplored the absence of a local Society. A few days later they met and formed themselves into the "Southampton Entomological Society." Others soon applied to join; but they came from all parts of the county rather than from the district around Southampton,

and by the end of 1921 it was decided to recognise this by changing the title to "Entomological Society of Hampshire."

The Society continued to expand, and in 1924 a series of publications was commenced. These, however, attracted contributors of wider scope than Hampshire, whilst new members joined from almost every county in the South of England. In 1929 a proposal was made that the title be expanded to "Entomological Society of the South of England," but a minority objected to the disappearance of the word "Hampshire," and unanimity was only secured by adopting the cumbersome title "Entomological Society of Hampshire and the South of England." By the end of the year opposition was withdrawn and the shorter title "Entomological Society of the South of England" was adopted.

It soon became apparent, however, that yet another change would have to be made: with few exceptions the matter contributed for publication in the *Journal and Transactions* covered the whole of the British Isles, whilst the membership became increasingly drawn from the whole country, including Scotland and Ireland. A final change of title to "Society for British Entomology" was, therefore, made in 1934.

The support given on the Continent of Europe and in America to the International Entomological Congresses, and the success in this country of conventions of devotees to other sciences, suggested that a need existed for an Annual Congress of British Entomologists. Such a series was inaugurated by the Society at Oxford in 1935 and was an instantaneous success. They were continued without interruption until that held at Manchester in 1939, when the outbreak of war caused their suspension.

Viewing the growth of the Society in retrospect, it is now easy to see that a need existed, unvoiced and unsuspected, for a Society specialising in British Entomology, which stood midway between the average local Society on the one hand, embracing too wide a scientific field over a too-restricted area, and the Royal Entomological Society of London on the other hand; and which, unencumbered by the maintenance costs of expensive headquarters, could be conducted mainly as a publishing society, at a moderate subscription and fees.

The 1939-45 War brought the Society a temporary but very unpleasant set-back. The whole of the Society's reserve stocks of publications up to December 1940, together with its collections and every record and Minute Book which it possessed, were destroyed by enemy action; whilst deaths and dispersals from Southampton broke up completely the foundation group of members. Suspended activity in the period immediately following brought fresh difficulties in regard to paper allocations and printing facilities when later a resumption of publication was attempted, and the persistence of rationing and other controls has prevented the resumption until 1950 of the series of Congresses.

All these difficulties have at last been overcome, and the Society now looks forward once more to fulfilling the needs which were the cause of its coming into existence, and which exist to-day as much as in the past.

BREEDING THE GEM (*NYCTEROSEA OBSTIPATA*)

A female Gem (*Nycterosea obstipata*) was captured at light on August 27th-28th, 1949, at Redruth, Cornwall. On August 28th, 31 eggs were laid, on which every one hatched on September 3rd-4th. The larvae were immediately put on groundsel (*Senecio vulgaris*). They were put in three approximately equal batches and divided again as they grew bigger.

There was no need to keep the food-plant fresh with water, as the larvae soon diminished it and gave it no time to get stale. Sweating gave me some trouble and caused the death of three larvae. To save further loss the larvae and food-plant were placed on blotting paper and the paper renewed each day.

The larvae spun cocoons from the leaves of the food-plant and started to pupate on September 23rd. Twenty-six imagines emerged, of which one was deformed.

The dates of emergence were as follows:—

Oct. 4th, 1949. 1 male and 3 females.
Oct. 5th, 1949. 9 males and 4 females.
Oct. 7th, 1949. 4 males and 2 females.
Oct. 8th, 1949. 2 males and one deformed specimen.

I had previously captured a female in a cornfield on August 6th, which laid 4 eggs, from which eventually one female was obtained.

W. GERALD TREMEWAN (940).

LEPIDOPTERA NEAR HULL IN 1949

On September 11th, 1949, I visited a common near Hull. After beating oaks, birches and sallow bushes with a remarkable lack of success, I set off for what I thought might be a better spot across the common.

On the way I found several larvae of the Small Chocolate Tip (*Clostera pigra*) on Creeping Willow and Sallow. On the Creeping Willow, the leaves had been skimmed off by a leaf-eating beetle and its numerous larvae, leaving just brown skeletons for the unfortunate *pigra* to browse on. Sallow was infested by sawfly larvae and in some areas the *pigra* larvae were feeding by day and completely in the open. Later on I came across a 'run' of *Vanessa cardui* (the Painted Lady). After investigating several nests, I managed to obtain four larvae in a half to three parts grown state. I have noticed before that, on finding a deserted nest, the chrysalis cannot be found on the same foodplant, so apparently this species wanders off to pupate. This species comes back to the same tree or beat within a matter of fifteen yards. I think that it is the homing instinct to the umpteenth generation that brings this insect back to the birth-place of its original parents.

Later still I found a few *Laotioë populi* (Poplar Hawk) larvae in ones and twos on small sallow bushes. On the last bush I inspected, about eight feet high and four feet in diameter, I found a dozen or more larvae, varying from the bright green and yellow with small red spiracles to green with red spots and blue-green with mauve spots—all apparently brothers and sisters.

I noted last year that during the period June to September beating had very poor results.

From August onwards I saw *Colias croceus*, noting one var. *helice* on September 3rd, but other than that, no other female. This worked out as in 1947 about 20 males to one female and most other reports were of the same nature.

I had an entirely unprompted report of a White Butterfly with red spots seen in Hull on the afternoon of September 11th, 1949. This is pure guesswork, but has the *Parnassius apollo*, L., been recorded in the United Kingdom before this?

D. WADE (1104).

(Note.—Compare the article by H. Ray (678) on 'The Breeding Sites of Butterflies' in Bulletin No. 109 (Jan. 1950), p. 6, in connection with homing instinct.

There can be no real certainty that the *populi* larvae on one bush were from one female; it is generally considered, if there is an accumulation of larvae, that they are the progeny of several parents—a deformed female would, however, be compelled to lay her eggs in close proximity.—Ed.)

PET MANTIS

Why not keep a mantis for a pet? An American business man who bought a parcel of wild woodland for the sole purpose of studying and photographing its insect population found that a female mantis became an amusing companion. She would walk over his desk and watch him typing with all the appearance of absorbed interest and would practically sit up and beg when feeding time came round!

A mantis will eat any other insect of whatever size and is a good gardener's friend. When the supply of live prey is reduced in autumn it can be given (*pace* Mr Webb) corned beef or breakfast sausage to prolong its life until perhaps November.

Those who wish to learn more will probably find in a public library a copy of *Near Horizons* by E. W. Teale, from one of whose photographs the accompanying sketch has been designed.

W. J. B. CROTCH (1181).



PHOSPHORESCENT MILLIPEDES

On returning home from an evening walk through the Suffolk countryside, at about 9.30 p.m. in mid-September last year (1949), I noticed a patch of light in the grass by the roadside which resembled the glow of a cluster of glow-worms. On closer examination, I discovered the glow was caused by a number of millipedes, giving off a phosphorescent light throughout the whole length of their bodies. When examined in daylight, the millipedes were found to be about $1\frac{1}{4}$ " long and of a light tan colour. The body was covered by a hard chitinous exoskeleton, which reminded me of a beet wireworm.

Could some member of the Society help me by explaining the phenomenon and identifying the animal?

D. N. SHIELD (1156).

'T WAS EVER THUS!

After four whole days' collecting in the New Forest, at Easter 1900, with very little to show for it, on account of adverse weather, F. M. B. Carr reported: "We returned home on Tuesday, and the following day the weather immediately became almost perfect." — *The Entomologist*, 33, 1900, p. 204.

REVIEW

A List of the Butterflies and Moths Occurring in the Neighbourhood of Ashford, Kent. By E. Scott, B.A., M.D. 46 pp., $8\frac{1}{2}$ " \times $5\frac{1}{2}$ ", with one map. Boards, 6/-; 2nd Edition. Sole Distributor: E. W. Classey, F.R.E.S.

The reviewing of a local list is never a very acceptable task, for such a list always contains the results of many years of field-work by local men and their associates, and it is not possible to point out omissions. In the case of the present list, the area covered is one of the richest localities for *Lepidoptera* in Britain, and as a "Kentish man" I feel very proud of the fact that I know this district

well enough to love it sufficiently to want to return there year after year.

In this edition, Dr Scott adds over 40 new species to the original list, bringing the total number recorded to exactly 500 species. This, to my mind, in no way exhausts the possibilities of the area, for, as the author points out, much of the area will bear much more investigation.

Dr Scott is generous enough to name the individual woods, thus throwing open the area to all collectors and students; the places mentioned are easily located on the map provided. It is to be hoped that this gesture will be appreciated by the users of the list and that moderation will be shown in removing insects from what, in several instances, is their only British habitat.

The names *Cucullia gnaphalii*, *Pseudophia (Minucia) lunaris*, *Catocala fraxini*, *Madopa (Colobochyla) salicis*, etc., etc., are enough to arouse the interest of everyone and, at the other end of the scale, I have yet to find a better list of the Pugs, for 33 species are listed.

There are a few spelling errors (mostly typographical). The Brimstone is spelled Brianstone, and in the Section headed *Zygaenidae* there are no fewer than 4 errors. These are, however, so minor that one can forgive them on account of the otherwise excellence of the list. One point which will not be popular is the use of capitals for the specific names. This contravenes the accepted rule regarding the point. I feel also that naming authorities should be quoted in all entomological publications, and trust the author will observe these points when the next edition is forthcoming.

To sum up, the science has much for which to be grateful to Dr Scott and his collaborators. This is a job of work which will materially forward our knowledge of the distribution of the British *Lepidoptera* and will be of inestimable value to all who wish to have the collecting holiday of their lives.

H. E. H.

JUST PUBLISHED

A LIST OF
BUTTERFLIES and MOTHS

(Macro-Lepidoptera)

Occurring in the neighbourhood of ASHFORD, Kent

By E. SCOTT, B.A., M.D.

2nd (revised) edition 1950

Price 6/-

(6/4 post free)

I can also supply the 1st edition (1936) at 3/1 post free—
or the 1st and 2nd editions together for 9/- post free.

This list is a very important one and covers an area which probably provides the finest collecting in the South of England and includes the now famous Ham Street district.

It is interesting to compare the differences in the lists of 1936 and 1950: much more has been learned about the Fauna and many of the insects believed to be rare migrants have now proved to be native or established in this most interesting district. The 1950 edition also contains the record of a Moth new to the British List.

Both editions contain a folding map of the district which has been designed from the collecting point of view, showing the boundaries of built-up areas, water and woodland.

E. W. CLASSEY, F.R.E.S.

Natural History Bookseller

5 CARLTON AVENUE, FELTHAM, MIDDLESEX

I HAVE AN EXTENSIVE STOCK OF ENTOMOLOGICAL BOOKS
CATALOGUES ON REQUEST

LIVE STOCK WANTED

I am compiling a new directory of Amateur Entomologists who are willing to co-operate every year in supplying me with fresh breeding stock of British, Continental and Exotic lepidoptera, in all stages, i.e.: fertile ova, living larvae, chrysalides and pupae of butterflies and moths. This can be arranged either by cash payments or in exchange. Every transaction will be treated as confidential, and to some collectors it will be a way in which they can dispose of surplus stock whenever it becomes available.

URGENTLY WANTED NOW: Winter pupae of *cardamines*, *T. rubi*, *argiolus*, *napi*, MANY OF THE HAWK MOTHS, *pavonia*, *vinula*, the "Prominents," and other "showy" species.

IN STOCK NOW: for sale or exchange. Fertile ova of *C. fraxini*, the Clifden Nonpareil (Kent stock): price on application or exchange terms sent on request.

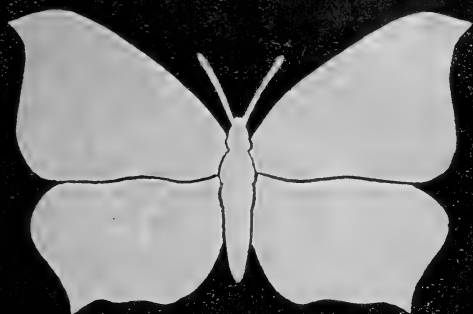
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"The Butterfly Farm," Bexley, Kent

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PRESENTED
5. 11. 1950

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY



EDITED by TREVOR TROUGHT, M.A., F.R.E.S

THE ROYAL PHOTOGRAPHIC SOCIETY

INVITE

Members of the AES

to a Lecture on

INSECT PHOTOGRAPHY

BY

S. BEAUFOY, B.Sc., A.M.I.E.E., F.R.P.S., F.R.E.S.

(AES No. 627)

The Lecture will be given on Tuesday, November 14th, 1950, at the Society's Rooms, 16 Princes Gate, London, S.W.7, at 7 p.m.

Members wishing to attend should apply for tickets (giving their AES membership number) to

L. E. HALLETT, Esq.

Secretary,

Royal Photographic Society,

16 Princes Gate, S.W.7.



AES

No. 119

BULLETIN

NOVEMBER 1950

AMATEUR EXPERTS

The leading article by Mr W. J. B. Crotch in the September *Bulletin*, No. 117, p. 77, prompts me to say that I believe, with him, that we must organize research among the members by team work, and we must do it through the *Bulletin*. Otherwise many amateurs are wasting their time, money and energy. For instance, I went to visit an old entomological friend shortly after the war. I knew him in 1939 when he told me he had collected insects for twenty-five years. He had amassed thousands of insects of all orders and from all countries. The house was full of store boxes and exhibition cases. He had died during the war, but his widow had saved his insects. I examined them and found them beautifully set and neatly labelled. I had hoped to find out some valuable information of the district fauna, but of what use is a label which says "Pine Hawk, reared, Tupton, 22.1.37," when it is apparent that many of the insects were bought? I asked for his old notebooks, but he had never kept a diary or any sort of a record, so his thousands of moths were of no use to me, and, probably, to no one else (I told the local museum committee about them but they also found them useless) and all the knowledge of biology which he had gained had died with him. For a long time after this experience my own collection lost its attraction for me. I could see that I, also, was gathering an unwieldy assortment of insects which would be as useful as a collection of broken bottles.

Gradually I turned my thoughts to some kind of specialisation, but decided that this would only aggravate the sickening feeling of the entomologist when faced by the inability to give a name to 999 out of 1000 insects met with every summer. Moreover, when the amateur specialises he loses his status.

Now it seems to me that the solution lies in the modern technique in school teaching—'GROUPWORK.' In the classroom the children split up

into groups of two to eight pupils who co-operate in the search for knowledge. Each group takes one particular aspect of the subject for special study and is accepted by the rest of the class as experts, to whom all help is given. Later in the year, the group leader gives an account of the group's findings to the class. If something like this could be organized in the AES, I think it would put new life into many members who are coming to the stage when it seems that they are just wasting their time. It might even lead to the growth of a new species, "the amateur expert," since I can see no objection to one member tackling a subject on his own, but in these days one student can't get very far without co-operating wholeheartedly with others. At first it will be necessary for group leaders to step forward and advertise their aims and objects in the *Bulletin*, where they might gather together a few like-minded workers. Of course, a member should be able to change to another group when he feels he has lost interest. Each group should appoint a secretary who will write to the *Bulletin* asking for or giving information, and later digest all the information so gathered in order to place it on record. This would make the *Bulletin* a more friendly organ and encourage amateurs to confide in it. In my own case, I am interested in the life history of the Cockroach (*Blatta orientalis*) and the distribution of the Elephant Hawk Moth (*Deilephila elpenor*) and should be delighted to hear from any amateur interested in the same.

But the main function of the groups would be to collect from the whole body of the AES the information which members discover but do not know what to do with. For instance, in 1939 the Buff Ermine (*Spilosoma lutea*) was far commoner in this area than the White Ermine (*S. lubricipeda*); this year, the larvae of the latter are found everywhere, but those of the former are completely absent. This news might interest someone, but to me it is a detail which I can fit in nowhere. Then

very often I find insects or galls which might be valuable to some other collector, but I do not know who requires them. If there were sufficient groups, very few facts would be lost.

There are, no doubt, many members who can suggest valuable topics for amateurs to investigate, and I trust they will bring them into the pages of the *Bulletin* as soon as possible.

J. H. JOHNSON (1040).

(The Editor welcomes the above thoughtful and constructive article and throws open the columns of the *Bulletin* for members who have concrete proposals, implementing the lead given by the President and Mr Johnson.)

CORRESPONDENCE

18 Abbotswood, Guildford,
Surrey, September 3rd, 1950.

The Editor.

Sir,

I was very interested in the article by W. J. B. Crotch (1181) in *Bulletin*, No. 117, p. 77, where he suggests that members could be of great assistance in the matter of small lines of research. I am particularly interested in a weevil, *Otiorrhynchus arcticus* (Ol.) var. *blandus* (Gy.), which I encountered while making a collection of Coleoptera from Skokholm Island. I would like to start Mr Crotch's ball rolling by asking members interested in *Coleoptera* if they have encountered this weevil, and, if so, where, and in precisely what environment, with details of plant types where possible.

Yours sincerely,
A. E. G. PEARSON (1667).

TWO SUGGESTIONS

May I offer the following suggestion as an improvement to Dr Fidler's beating tray (*Bulletin* No. 110, p. 9). I find that when beating high branches, one's reach is somewhat limited, because of the horizontal position of the handles. Accordingly, for the 3" coach-bolt, as shown, I have substituted an 8" length of rod, threaded down at one end for about 3", and pointed at the other end. A nut is first screwed down to the end of the long thread; the stays, washers, etc., are then assembled, and all held together by a wing-nut as Dr Fidler describes. For dealing with high

branches the tray is held by the 5" length of rod projecting under it, thus giving a much increased upward reach. (The handles, are, of course, fastened together.) A length of tube slipped over the rod will still further increase this reach, if necessary. After beating, the pointed end of the rod can be stuck into the ground, when the tray will "stay put" in a convenient position for examining the catch.

It is true that the projecting rod makes the tray less compact for folding up, but I find that the extra reach more than compensates for this.

Perhaps some of your older members find, as I do, that their eyes are not so good as they used to be, and that setting a number of small moths causes uncomfortable strain. I have covered most of my smaller setting-boards with dark green paper, and find that this makes a tremendous difference to eye-comfort.

A. L. H. TOWNSEND (1691).

ON COMMON WING PATTERNS IN OTHERWISE DIVERGENT TROPICAL BUTTERFLIES

Having collected and studied exotic butterflies for some years, particularly those of tropical America, it has occurred to me that several shortcomings exist in the theory that a form of mimicry has been evolved by a number of species inhabiting the basin of the Amazon. I refer to the theory expounded originally by Bates and later supplemented by Müller, and not to the protective resemblance to non-living objects exhibited by certain other groups of *Lepidoptera*.

I hardly think it necessary to describe in detail the views put forward in this theory as this would be a mere repetition of what can be found in almost every work on the subject of general entomology and I must admit surprise that so many well-known authorities appear to accept this hypothesis without raising any objection to it.

My main objections to the Theory of Mimicry may be briefly summarised as follows:—

1. Birds, lizards, etc., although known to attack and devour the imagines, rarely do so and not nearly sufficiently often enough to play an important rôle in the balance of nature.

2. Butterflies are mainly kept in check, numerically, by a high mortality rate in the early stages of their metamorphoses.
3. There is a considerable number of unexplained exceptions to the theory in the butterflies of the world.

It would be as well to examine the above points and in the same numerical order.

1. Bates' theory pre-supposes a heavy slaughter among the insects by their natural enemies, *whilst in the perfect state*, after the wings are fully expanded and before pairing and egg-laying. This being the briefest and also the most active stage in a butterfly's career, it should also follow that it is least liable to succumb to the attacks of its enemies at this time.

2. If any "mimicry" process of natural selection for the protection and continuation of the species were to operate it would surely do so here, as it is in the larval stages that we find the required mortality ratio to support the theory. Of course, it may be argued that as the "mimicry" is now a *fait accompli*, its usefulness has been achieved, and birds, etc., no longer attack the imagines. This, however, would only result in the "mimics" increasing in numbers to such an extent as to cancel out their immunity by providing their enemies with at least an even chance of a palatable prey.

3. There are scores of "unprotected" genera, found alongside distasteful species, which show no signs of evolving a common pattern with their companions. Then again we have numbers of cases where individual species deviate from their usual family pattern towards that of another family for no apparent reason and where both groups are believed to be palatable. We need only refer to our own Marbled White to illustrate the latter point, although on the continent there are other species of *Melanargia* which resemble the *Pieridae* even more closely.

Taking the above factors into account, I am inclined to the opinion that the volume of evidence against the theory of mimicry outweighs the arguments usually expressed in its favour.

As the foregoing is largely in the nature of criticism, it may be as well

to consider an alternative explanation for the prevalence of common wing patterns among widely separated genera. My own view is that these creatures are retaining to-day the colours and pattern of the original ancestral form from which they sprang. In other words, all the genera in question, e.g., *Mechanitis* and *Melinaea* of the *Ithomiinae*, *Dismorphia* and other groups of the *Pieridae*, and the species concerned of *Heliconius*, resulted from a common ancestor, branching off, however, in time to attain to varying degrees of specialisation, such as the atrophy of the prothoracic legs in the case of the *Ithomiinae* and *Heliconiinae*, but with the colour and pattern of the wings remaining unchanged throughout the ages.

This fixity of pattern over such a long period could be explained by the fact that all these species are found in the same area and are therefore subject to common environment as regards climate and vegetation. It will be noted that this type of "mimicry" is confined to the tropics, not only of America but also of Africa and the Indo-Australian region. Very rarely does the phenomenon extend into the temperate regions and then only in cases where the respective faunae overlap or are ill-defined owing to the absence of natural barriers such as deserts and high mountain ranges. The butterflies with which we are concerned have, therefore, never been subject to the climatic extremes occasioned by successive Ice Ages, and so have lived and evolved with considerably less alteration of environment than those of the present-day temperate regions.

In conclusion, I should like to draw attention to the remarkable resemblance between two genera, widely separated in both habitat and development, as an illustration of the above reference to the persistence of ancestral pattern despite more important anatomical specialisation. I refer to the Papilionid genus, *Leptocircus*, of the Old World and *Ancyrluris* and its allies in the *Riodinidae* of the Neogean fauna. I can see no other explanation for such a striking similarity than the retention, by modern forms, of the superficial features of a long extinct link.

SPRINGING, DROOPING, AND CURLING

(Continued from Bulletin No. 116, p. 70)

If everything else fails, an application of liquid cellulose applied to the base of the wings from the lower side will generally be successful in preventing springing. This is best done just before setting (which must then be carried out speedily) or immediately after removal from the setting board; but, if the insect shows signs of springing when taken off the board, apply the cellulose and strap it down again at once. Liquid cellulose should, of course, be applied only as a last resort, since once applied it is impossible to re-set or relax the specimen without a very great deal of trouble, if at all. It must, of course, be applied sparingly, since, if it soaks through to the upper surface of the wings, it will produce a shiny greasy effect which it is impossible to remove. I have never used glue for this purpose, since I found that it generally gets soft in damp weather and some springing may result, even with a liberal application, besides being messy to apply and unsightly. Cellulose if carefully applied can be almost unnoticeable. The best method of application is to dip the setting needle in the liquid and to use the small drop which will be found on the needle when it is removed. The amount of cellulose which sticks to the needle varies with the thickness of the needle. A thick needle is therefore required for large specimens and a thin one for small ones—I have myself seldom had to use cellulose and only in specimens where the hindwings have drooped or sprung at a different angle from the forewings. I have set specimens which have been packed in papers for over ten years, using the technique with a liquid relaxer mentioned on p. 70, and have never had any of them spring. I have only had it happen where for some reason the specimen has been too dry when the setting was done and most often with moths.

(To be continued)

R. E. PARSONS (1512).

YORKSHIRE LEPIDOPTERA

A. H. WRIGHT (355), writing from Carcroft, near Doncaster, says that

a fine male specimen of the Lime Hawk Moth (*Mimas tiliae*) was brought to him on June 4th, 1950. Larvae of this species were sleeved out in 1948, but only three survived, and they were midget specimens.

P. W. R. WALTER (1493*) notes the occurrence in the Doncaster district of South Yorkshire, during July and early August 1950, of several specimens of the Lappet Moth (*Gastropacha quercifolia*). He himself had found eggs on blackthorn. The species seems seldom to have been recorded from this area.

He also says that the Leopard Moth (*Zeuzera pyrina*) has been reported in the district recently, and that a specimen of the Striped Hawk Moth (*Celerio livornica*) was taken by a friend of his near Barnsley in the summer of last year (1949).

L. B. HORNER (917) reports that he found a Death's Head Hawk Moth larva (*Acherontia atropos*) on August 15th, 1950. The larva was full-grown and had been feeding on potato in a local garden at Guisborough, North Yorkshire. It was overhanging the footpath and why it had not been trampled underfoot, he did not know.

OTHER RECORDS

The thrill experienced by Mr Horner on taking what he supposes (as he says) "all Amateur Entomologists would like to take at some time or another on their bug-hunting rambles" has also been experienced by the Editor in full measure this summer.

On August 2nd, 1950, Mr J. H. Quinton, Senior, of Tysoe, Warwickshire, brought him a full-grown *atropos* larva found in the allotments at Sibford Gower, North Oxfordshire. An examination of the spot next day showed that this larva had been feeding on potato.

On August 9th Mr Derek Walton found a full-grown *atropos* larva crossing a side-road at Hardwick Cottages, Tysoe, Warwickshire. The Editor naturally went to look and found another larva in the middle of the Banbury-Stratford main road, which had clearly been jostled aside by a lorry. Another was found still feeding on a large clump of Bittersweet or Woody Nightshade (*Solanum dulcamara*) which covered the stump

of an uprooted elm tree in the hedge. No potato field was near and the presumption is justified that the other two larvae were also feeding on this plant. The larva which had the motor accident died later, but the other three buried themselves as expected. Only one, however, has pupated successfully.

Again, on August 28th, a male *Convolvulus Hawk Moth* (*Herse convolvuli*) was found by Mrs Levack, of Stratford-on-Avon, on a heap of sand in the back-yard of a Tysoe shop; then a female *H. convolvuli* was found by Master John Edwards on a

footpath in Middle Tysoe at 1.15 p.m. (B.S.T.) on September 5th, 1950. This was not in good condition and died without laying any eggs.

Mr Quinton later brought three Privet Hawk pupae from the Sibford Gower allotments.

The Editor thinks that this year may prove to have been a good year for Hawk Moths. He agrees, also, with Mr P. W. R. Walter (see above) in thinking the Lappet Moth is spreading. One larva was found by Master John Price and a male was caught at light in Tysoe this summer.

STUDYING THE EMPIDIDAE

INTRODUCTION.—This family of flies, of which there are 326 British species, may be distinguished by their small globular head and horny piercing proboscis. They are medium to small sized, mainly of drab colouration and possess predacious habits. Very little is known concerning their biology and a vast field of research awaits students interested in this aspect of their study. Although there is no work in English dealing exclusively with the British species, by taking a little trouble much progress can be made by using continental works in conjunction with notes and papers scattered throughout various British entomological Journals and in the Transactions of entomological societies. A list of references is appended at the end of this article.

COLLECTING.—The adults are to be found in varying types of habitat from May to September. Fringes of woods, hedgerows and woodland paths afford good localities. Flower heads of Umbelliferae, thistles, buttercups, etc., should be examined. Many species may be found on low vegetation and are easily captured in glass-bottomed boxes. Species of *Hilara* 'dance' in swarms over water and sometimes round trees. Species of *Empis* and *Rhamphomyia* also possess this 'dancing' habit. A net is necessary for capturing species in flight or swarming and pairs *in cop*. I use a large 'kite' net for general work but, for collecting small species, a small muslin net can be used if the species is not easily 'boxed.' Specimens are best kept alive in the field in glass-bottomed boxes, as damage by condensed moisture often occurs if specimens are left in laurel-tubes or ammonia-jars. I prefer strong liquid ammonia (.880) for killing *Diptera* as they are then perfectly relaxed and ready for mounting. Strong ammonia kills fairly quickly. I use killing-jars slightly larger than the collecting boxes; then the lip of the box fits snugly into the jar and the ammonia vapour is not lost to the atmosphere and the insects can be observed through the glass 'bottom' of the box. A folded cone of filter paper or blotting paper should be placed inside the jar to prevent the insect from being damaged by condensation inside the jar.

MOUNTING.—*Empididae* should be carefully pinned vertically through the thorax, taking care not to destroy too many of the bristles as these are important taxonomic characters. The wings should be arranged so that they do not obscure the abdomen or the pleurae and in such a position that they can be easily examined with transmitted light. The male genitalia should be drawn out with a setting needle to facilitate easy examination. I keep a collection of dissections of the various parts of the body containing taxonomic characters mounted on microscope slides and these prove of great assistance for comparison when naming specimens. Specimens with prey and pairs *in copula* can be mounted with fine pins on strips of polyporus with one large pin securing the whole mount (see Fig. 1). Full data should then be affixed to the large pin. Very small species can be cross-pinned as described by E. W. Classey for the Mosquitoes (vide *Am. Ent.*, 8, 11: 1945; *AES Leaflet No. 11*, pp. 4-5) or pinned under the thorax between the legs to avoid damaging the pleurae and thoracic bristles. The method of storing the reference collection is a matter of choice.

BIOLOGY.—Little is known of the life history of the *Empididae* and what observations have been made are mainly by continental authors. The larvae

are recorded from earth beneath leaves in woodlands and in decaying wood while a few are aquatic. They are carnivorous and hibernate throughout the winter, changing to a pupa and finally an imago the following spring or summer. According to Beling and Brauer the known larvae are cylindrical, more or less spindle shaped, consisting of twelve segments with a small retractile head. The pupa is free.

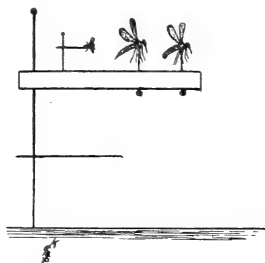


Fig. 1. Polyporus mount of *Empididae* and prey. Empids pinned between legs from underneath to avoid damaging thoracic bristles.

PREDACIOUS HABITS AND COURTSHIP.—The males of some species of *Empis*, *Rhaphomyia* and *Hilara* capture small flies and other insects which they present to the female during courtship. While the female is feeding upon it copulation takes place. Pairs in copula with prey can easily be distinguished by their slow clumsy flight. Different methods of presenting the prey are adopted by different species. Some *Hilara* spp. spin a slight web round the prey and one American *Empis* encloses its prey in a 'balloon' of froth. The types of prey taken by different species and in different localities form an interesting study. The females of some species take prey independently of the males while in other species neither sex takes prey. The papers by A. H. Hamm are especially recommended to students interested in the predacious habits of this family and a large collection of these flies with prey, formed by Mr Hamm, is housed in the Hope Department of Entomology at Oxford University Museum. Any insects taken with prey should be sent to the Hope Department for incorporating with the fine collections already there.

CLASSIFICATION.—The family is split into six subfamilies: the *Tachydromiinae*, *Hybotinae*, *Ocydromiinae*, *Empidinae*, *Hemerodromiinae* and *Clinoceratinae*. The *Tachydromiinae* are separated by the absence of the discal cell, the discal vein being unforked and the anal vein generally absent or weak if present. In the other subfamilies the anal cell is usually present. The *Hemerodromiinae* have the auxiliary lobe or 'alula' very small or wanting and elongated front coxae. The *Clinoceratinae* also have the reduced alula, but are distinguished from the *Hemerodromiinae* by the slender less elongate front coxae. Of those subfamilies with a normal alula the *Empidinae* are distinguished by their long downward-projecting proboscis. The *Ocydromiinae* and *Hybotinae* have a shorter proboscis, but in the *Ocydromiinae* the short anal cell and the presence of a discal cell separates them from the *Hybotinae* which have a longer anal cell or, when this is short, no discal cell.

The characters of most importance in the particular genera should be borne in mind when mounting so that these characters can be exhibited to their best advantage. The acrostichal and dorsocentral bristles are of primary taxonomic importance in most genera and special care should be taken to avoid destroying too many of these when pinning specimens vertically through the thorax.

BOOKS.—The best work is *Diptera Danica*, part III, by Lundbeck, the text of which is in English. This work covers many British species but, of course, not all. However, J. E. Collin published a series of papers entitled 'Notes on the *Empididae* with additions and corrections to the British list' in the *Ent. mon. Mag.*, 1926-7. These notes used in conjunction with Lundbeck's work enable the student to cover a fair amount of ground. The following is a short list of books and papers dealing wholly or in part with the *Empididae*:

COLLIN, J. E. Notes on the *Empididae* with additions and corrections to the British list. *Ent. mon. Mag.*, 1926-7.

HAMM, A. H. Observations on *Empis opaca* F. *Ent. mon. Mag.*, June 1909.

Further Observations on the *Empinae*. *Ent. mon. Mag.*, July 1909.

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KENNETH G. V. SMITH (897).

THE COLLECTOR IN INDUSTRIAL AREAS

Part I. IN GENERAL

The ideal of every naturalist is to live and work in the midst of his favourite hunting ground, or at least within easy range of it. For some of our members this is their pleasant lot, but for many of us a day in the countryside or at some specially-noted ground is only an occasional pleasure and the highlight of the year. We are always welcomed by our "country cousins," and it is amazing how hospitable are our collecting friends when we town-dwellers do get a day or two with them. For the most part, however, we are bound day and night to stone walls, noisy streets and an almost complete lack of the facilities that make collecting worth while. A great number of young collectors in the towns and cities have given up their hobby because they feel the difficulties are too great. It is because of this that I feel a few words on the matter may assist our younger members.

For some twenty years I have collected lepidoptera almost entirely in the West Riding around Bradford, Leeds and Halifax. We have accurate records since 1860 and it will come as a surprise to many of our members to learn that during the ninety years covered, only 300 species of moths have been recorded, and of these less than 200 are of regular appearance. We are worse off still with butterflies, for in the same time only 11 species have been noted, and some of these but once or twice. Needless to say, I have exceeded these figures frequently on one visit to the

southern countryside lasting only a few days. Nor is the lack of different species the only point, for there is often a dearth of those which are present. Often two or three hours spent in hard beating will produce only half a dozen larvae.

The reasons for the shortage of insects are, of course, many. The fact that in the first place we are in the North of the country has some bearing on the matter, but the purpose here is only to consider the industrial aspect of the subject, and I would list the following reasons in order:—

1. *Smoke Pollution*. This is far and away the most important point. In Halifax an average of 60 tons of soot per acre falls every year. Within the actual built-up area of the town 80 tons per acre is usual. Every gardener knows the lethal effect of soot on insects and over a period of about a century this has seriously affected every species. It has meant that the insect has been forced either to adapt itself or die out—and most have done the latter. Within living memory scores of moths have ceased to occur in our towns and cities. An interesting proof of this adaptation is in sleeving different species. This year, for instance, a brood of Buff Tip larvae (which has adapted itself to the conditions) produced over 80% results whilst three hundred larvae of the Kentish Glory (which cannot adapt itself) failed to produce a single pupa.

2. *Lack of Foodplant*. Apart from garden varieties of plants there are very few foodplants available. The nearest wild violets are ten miles from

my home and a score of other important plants could not be found in twice that distance. Indeed, it is extremely difficult to rear the many species which one obtains on holidays because of this point.

3. There are many other reasons—excess of lights, human interference, etc., but the next article will attempt to assist young collectors to overcome these difficulties and to make the best of what is available.

(To be continued)

W. E. COLLINSON (247).

REVIEWS

Handbooks for the Identification of British Insects. Published by the Royal Entomological Society of London.

Vol. I, Part 6, Plecoptera, by D. E. Kimmins (May 31, 1950; 3/6). The *Plecoptera* or Stone-flies have received very little attention from British entomologists, so this publication, which will enable us to identify our captures, should lead to a closer study of the Order. It is largely from the papers by H. B. N. Hynes, published by the Freshwater Biological Association, 1940, and the study of the Nymphs by the same author, published in *Trans. R. Ent. Soc. Lond.*, 1941, that these Keys have been drawn up. The paper follows the usual line in these Handbooks, giving first a description of the Order, followed by a general life-history of these insects. A Key to the Families and Keys to the Genera and Species of the adults are given, and this is followed by Keys to the Families and Genera of the Nymphs. The paper consists of 17 pages and an index and has 49 diagrams of those external parts of the insect used in the identification of the nymphs and adults.

Vol. I, Part 9, Ephemeroptera, by D. E. Kimmins (May 31, 1950; 3/6).

A work on the identification of Mayflies has long been wanted, as the *Monograph of Recent Ephemeroptera* by A. E. Eaton, published in 1883-1888, has long been out of print. The present work consists of 17 pages plus an index and contains 55 diagrams. It gives, first, a short description of the Order, followed by a general account of the life-history of these insects. A Key to the Families is then given, followed by a Key to the species as an imago, and in many cases a Key to the sub-imago, with a note on the kind of locality in which they are to be found. Next the nymphs are dealt with, but owing to our present lack of knowledge of the nymphs of many species, it is only possible to include a Key to the Families and Genera.

The publication of this paper should lead to many more entomologists studying these insects, and adding to our knowledge of their life-history and distribution.

The production of both these parts of Vol. I. maintains that high standard we expect from the R.E.S.

E. E. S.

THE FESTIVAL OF BRITAIN

A Correction and an Apology

The Editor is sorry that in *Bulletin* No. 116, page 70, he wrongly said that Mr L. H. Newman had been appointed "official entomologist" to the Festival of Britain. This was not correct, though there seemed no reason to doubt the accuracy of this at the time. Any inconvenience or unease caused thereby to either Mr Newman or the officials of the Festival of Britain is regretted. Members, however, can still do their bit for the Festival of Britain by responding to Mr Newman's advertisement in the October number of the *Bulletin*.

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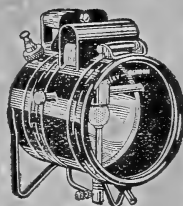
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Silkmoth Rearer's Handbook. Data for the revised issue to: W. J. B. CROUCH, 5b Stanley Crescent, London W.11.

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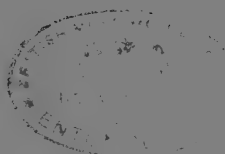
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PRESENTED

THE BULLETIN
OF
THE AMATEUR
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SOCIETY



EDITED by TREVOR TROUGHT, M.A., F.R.E.S.

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GROUPWORK

Historians reviewing the progress of the AES, in ten or twenty years' time, may point to 1951 as a milestone in its career. Our President, W. J. B. Crotch (1181) and J. H. Johnson (1040) in the September and November *Bulletins* (Nos. 117 and 119) point the way. The Editor, in *Bulletin* No. 95 (November 1948) encouraged each amateur to collect objectively, setting for himself a special target and working with that aim in view. "Groupwork" is clearly the next step and a great step forward. From the pooling of the knowledge of several workers and its critical examination, new ideas for further advances will emerge. These, thrown to the "group," will be taken up and worried, observations for or against noted, blanks of ignorance filled and the position consolidated for the next move forward.

What is required now? The formulation of problems, the formation of groups of like-minded members to investigate these problems and the emergence of the expert group-leader to direct the group-studies. The group-leader will evolve naturally as that one with the most enthusiasm, the most energy and the most imagination—and, of course, time to conduct the correspondence with other members of the group. There may be already some "unofficial" groups in existence.

The Editor's rôle would be, to some extent, that of a post-office and, with the help of the AES Advisers, a co-ordinator. The *Bulletin* would carry notes, notices, requests and résumés from the different groups, under their respective headings—as Mr Johnson says, "if there were sufficient groups, very few facts would be lost." The columns of the *Bulletin* await the constructive ideas of members.

SOME REMARKS ON THE PRESIDENTIAL INQUIRY

Readers will have read the President's article in the September *Bulletin* No. 117 under the title "Where are we going?" Much the same question was asked nearly 100 years ago by the Editor of the *Entomologist's Annual*, 1857.

In an editorial, with the heading "Is Entomology progressing?" he writes thus: "Entomology is the study of insects; the collector catches insects, but it does not follow that he studies them." Even earlier than this, stress was being laid on the importance of knowledge as against the comparative uselessness of mere collecting.

In 1826 Wm. Kirby and Wm. Spence produced *An Introduction to Entomology*. "An entomologist," they say, "will not be content with filling his cabinet with nameless objects for the sole amusement of the eye; but will also be anxious to acquire some knowledge of what he has collected, and to ascertain by what names they have been distinguished by scientific writers. Thus only can he himself derive profit from any discoveries he may make, or contribute to the further progress of the science."

This statement of the real purpose of Entomology guides the policy of the AES to-day, and is evident in the pages of the *Bulletin*.

The President admits the difficulty of pleasing everyone all the time. A word of praise is due to the Editor for the skill with which he steers a middle course, and provides, as far as is possible, something for all his readers.

If suggestions may be made, here are a few:—

1. More articles might be provided on the lines of the excellent "Insect Orders" by Brian O. C. Gardiner. One order a month, double page or more, written in understandable language, might be possible.

2. Microlepidoptera are shamefully neglected, almost totally ignored. Perhaps something could be done about this.

3. There are books in plenty, as well as monthly publications, dealing exclusively with Bees and Bee Keeping, so it seems hardly necessary for valuable space to be given to the same subject in the *Bulletin* (Vol. 9, p. 17).

The Editor has asked for suggestions and ideas for lines of co-operative research. The Geographical Distribution in the British Isles of the

various orders might be investigated. An entomologist writing very many years ago complained of the errors perpetuated by copying names from collections without verification. How much of the information in modern books is just plain copying from earlier ones? Has the distribution in the British Isles of insects been verified, and when, and by whom?

This would need a lot of organizing, but a start could be made, lepidopterists, dipterists, etc., all working in their own field, with recorders to collate the data.

The Editor is quite right in reminding us that the *Bulletin* is our publication. It is not much use members grumbling unless they are prepared to contribute something, even if no more than a few lines of personal experience or observation.

H. B. SARGENT (1189).

[Note:—As a sidelight on Mr Sargent's second suggestion, the Editor is informed that the present stock of AES Leaflets No. 13 and 14, Collecting Micros and Setting Micros is almost exhausted. Reprinting will be put in hand shortly; but there are obviously members who are interested in Micros and who might remove this stigma from the Bulletin.—Ed.]

NORTH DEVON LEPIDOPTERA

This is my first year of serious collecting and, included in about 150 species I have taken, I have been fortunate enough to record three new species for our locality (Ilfracombe) of North Devon—the Dark Spinach (*Pelurga comitata* L.), the Crescent (*Celaena leucostigma* Hb.) and the Nutmeg (*Scotogramma* (*Hadena*) *trifolii* Hufn.). The latter, although never having been noted here in about 100 years of records, appears to have arrived in numbers as I have taken 11 specimens. The curator of our museum excludes the possibility that it has been overlooked by previous collectors. Hawk moths have been scarce this year and only the common ones noted.

I am helping Capt. S. T. Stidston (40) with a survey of Devon *Lepidoptera* which he is at present making. Any information from North Devon members will be appreciated.

W. J. McCORMICK (1736).

Winchester House,
Larkstone Terrace,
Ilfracombe, N. Devon.

AN INTERESTING "HOPPER"

Every year, in my garden or neighbouring ones, that elegant bush-cricket, *Leptophyes punctatissima* Bosc., turns up. Less frequently, specimens are found indoors. It is widely distributed, for, as Dr Malcolm Burr remarks,¹ "although not generally familiar, it is a quite common insect and is probably to be found in every county in England and Wales, and a good many in Ireland and Scotland." W. D. Hincks (531) cites it² as widely distributed in the south to Lincolnshire. Adults are to be found from July to September, sometimes October; Vere Temple³ refers to a captive male which lived till November 3rd.

Several characters contribute towards ready identification of this rather spidery insect, the general appearance of which is distinctive. To my mind, the rather stout abdomen and typical stance give it a somewhat squat if not humpbacked appearance. The female is bright green in colour, the same ground-colour in the male being in quite distinct contrast to its brownish or reddish-brown markings. Close inspection shows a faint, but unmistakable, and well distributed dark brown or blackish mottling, which becomes quite plain under a hand lens. To all intents and purposes *punctatissima* is both wingless and devoid of wing-cases, though in the male the tegmina are represented by small flap-like projections. The prominent but not over-long ovipositor of the female is broad and curved.

These brief descriptive notes should give the tyro a good idea of the general appearance of this bush-cricket, while in the absence of named specimens for comparison, careful study of the female example figured by Burr (Plate V, opp. p. 128) will help considerably towards identifying captured examples. In the R.E.S. publication already referred to the female ovipositor is illustrated at Fig. 25 (p. 10).

I once watched a female ovipositing in a crevice in a window-sill. I found the ovipositor to be so strongly wedged that considerable force was necessary to extricate it. In the notes on the egg-laying procedure published by Vere Temple, comment is made on the way in which the palpi co-operate in ensuring correct placing of the eggs.³ As in the case of certain other insects, these sensitive palpi perform quite a variety of useful functions, at least one of which is illustrated by the following operations which I recently observed.

Just before "writing up" these notes (September 3rd, 1950), I had occasion to offer a gift of fresh and succulent *Prunus* twigs to a male *punctatissima* which had been captured while basking on a marigold flower in an adjacent garden on August 23rd. Perhaps my specimen had been feeding just prior to opening its tin*—at any rate, before tackling the fresh provender it proceeded very thoroughly to 'clean up,' paying particular attention to the long, waving antennae. First the tip of one, then that of the other, was brought down (by hooking the anterior limb on the same side over it), each antenna tip being passed carefully through a close but mobile 'net' formed more or less cradle-fashion by the continuously moving palpi before being released. Beginning at the end nearest the head, and employing both legs as 'crooks,' the hopper next passed the whole of each antenna through the 'cleaning net' so that each appeared as a gradually expanding loop which was loosed when the tip finally slipped through after the whole had been cleaned up. After a few more deft touches evidently calculated to complete the toilet, the insect began its meal, first attacking the edges of the leaves and afterwards concentrating on the central areas.

So far as I have been able to ascertain, the feeding procedure varies somewhat. Leaf-edges do not always receive priority, for oak leaves which I have supplied, while well perforated all over their surface, have shown little sign of having been devoured from the edge. Possibly a lot depends on the tenderness or otherwise of the food. *L. punctatissima* seems to be not over fussy in its choice of foliage,

*For obvious reasons, roomy, well-ventilated cages are the best containers for breeding or study material (see the new *AES Journal* for details of Breeding Cages—Ed.); when such containers are in short supply, tall tins of ample proportions—provided good ventilation is ensured—are quite useful as temporary accommodation and the insects seem quite happy in them. The fabric with which they are 'topped' should not be too flimsy: I have had plentiful evidence that the strong jaws of some hoppers can very soon cause large gaps to appear! Generally speaking, jars are not to be recommended; in my experience, neither Short-horns nor Bush-crickets ever thrive in them. Also the insects soon become damaged, shedding limbs and antennae left and right.

though that of oak is evidently popular. A fair number of trees and shrubs figure in its diet, and some low-growing vegetation also receives attention. Incidentally the specimen referred to in these notes, while being shown to colleagues during a field excursion, unconcernedly devoured half a leaf of stinging-nettle in a remarkably short time.

It is to be hoped that beginners will not allow either inexperience or lack of scientific knowledge to deter them, if interested, from taking part in the inquiry into the distribution of Short-horned Grasshoppers and Bush-Crickets which I have instigated through the British Empire Naturalists' Association, and which has already received valuable support from confrères of the AES. Particulars will be found in *Bull. No. 115* (p. 62) and further details, if desired, may be obtained from the writer (address: 56 Cranmore Lane, Aldershot, Hants). I am sure that, for many who, like myself, have not hitherto found time or opportunity to accord the much-neglected *Orthoptera* the attention they deserve, this investigation offers an excellent means of becoming more familiar with these insects and their habits while at the same time adding to the common pool of entomological knowledge. (*This seems a case for 'Groupwork.'*—Ed.) Breeding and rearing, too, will help, for a lot remains to be learned regarding the life-histories of even quite common species.

It seems worth adding that, for a start, the tyro need not necessarily rove far afield for his material, since quite a number of species occur in gardens, shrubberies and the like. Some—*inter alia*, the small and delicate-looking long-horn, *Meconema thalassinum* Deg.—are attracted, sometimes into houses, by light.

PETER MICHAEL (748).

REFERENCES.

- (1) *British Grasshoppers and their Allies* (1936), p. 129.
- (2) *R.E.S. Handbooks for the Identification of British Insects*, Vol. 1, Part 5, *Dermaptera and Orthoptera* (1949), p. 11.
- (3) Temple, Vere. (1950). Notes on *Orthoptera* in my garden during the summer of 1949.—*Entom.*, 83: 82-83.

THECLA PRUNI YEAR 1950

This has proved an excellent year for *Thecla pruni* in its stronghold in Huntingdonshire. While collecting

with the Rugby Natural History Society in June, I observed *pruni* in abundance. The insects were keeping to the tops of the old blackthorn hedges, rarely venturing down to ground level. They proved to be in excellent condition, and must have only recently emerged. While *pruni* occurs plentifully in this district, however, it should be pointed out that it is still extremely local, and over-collecting could easily bring about extinction, there being but three or four known localities for it in the whole of Great Britain.

R. G. CAVE (1938).

COLLECTING IN THE HIGH- LANDS

At the foot of the very interesting article in the October *Bulletin No. 118*, by Mr F. H. Lyon, he mentions having seen, in an old Somerset collection, a specimen of the Green Arches, *Anaplectoides (herbida) prasina*, which was labelled "Forres."

The late Sir Beckwith Whitehouse took this insect at Aviemore and bred the moth through the same year (1936) by forcing. They were very fine specimens; he kindly gave some to me, which are in my collection.

G. B. MANLY (427).

THE WELL-SET MOTH

There is an old saying that "Any insect that is worth setting at all, is worth setting well." A very great authority on Lepidoptera has said in one of his books that setting is "perhaps the most tedious work. . . ." But surely this is rather an unworthy view. I much prefer to think of setting as an interesting job requiring the exercise of a little patience—but patience that is amply rewarded. And it needs very little more patience to set well than to set badly. Indeed, though it is often necessary to include a *bad specimen* in the collection, the inclusion of a *badly set* one, except in certain exceptional circumstances, is hard to excuse. Not only are well-set moths far more pleasing to the eye than the lopsided, split-wing creatures, with an uneven number of antennae and legs, that seem to preponderate in some collections; but good setting has a real scientific value, in that it simplifies examination and study. The first of these considerations must surely appeal even to those collectors who merely collect; the second is brought home very strongly to the student

overseas, who often comes across species or genera, new to science; and where in any case, very many moths taken are unknown to the collector, and their identification may depend on such things as wing-venation, frenula, fore-tibial processes, mid- and hind-tibial spurs, and so on. If these things cannot be clearly seen, identification may be quite impossible without pulling one or more specimens to pieces for examination.

A perfectly-set moth has the wings set squarely: i.e. with the inner margin of the forewing at right angles to the body, just covering the costa of the hindwing. The wings have not been split in setting, nor disfigured by needle-holes. The pin is of an appropriate size; piercing the centre of the thorax; and upright, whether viewed fore-and-aft or sideways. The moth is nearer to the head than to the point of the pin. The moth's head is held straight, not leering up at you over one shoulder. Antennae are spread at a natural angle. Abdomen is straight and level; neither drooping nor cocked-up. Forelegs are evenly stretched out in front; midlegs parallel to body, not squashed under the wings; hindlegs almost parallel to body, with at least the tarsi visible from above. (In the case of moths with narrow wings, and very long legs, e.g. the "Plumes" and many *Pyralidae*, the mid- and hindlegs are better set at an angle with the body, and not parallel.)

The most common faults in setting seem to me to be:—

- (1) Imperfect relaxation. Result, needle-holes, split wings, tegulae and patagia standing up away from thorax, loss of legs and antennae, springing.
- (2) Forewings set too high. Result, a very ungainly and unnatural appearance.
- (3) Pin not vertical, or not central. Result, loss of legs; wings split, owing to difficulty in setting; untidy appearance in cabinet.
- (4) Moth too high, or too low, in groove. Result, wings bent to an angle at base, broken frenulum, springing.
- (5) Abdomen crooked, drooping or cocked-up. Result, very poor appearance, abdomen easily broken off.
- (6) Legs carelessly set, or not set at all. Result, difficulty in examination, and often a horrid tangle when seen from below.
- (7) Head not square. Result, a most unpleasing appearance.

- (8) Part of wing left uncovered while setting. Result, tip-curling; lines across wing made by edges of setting-strip.
- (9) Premature removal from board. Result, inevitable springing or drooping.
- (10) Hasty or careless removal from board. Result, broken antennae, legs, or abdomen.
- (11) Individuals of the same series at different heights on their pins, or on different sizes of pin. Result, appearance of series spoilt; those too low on the pin cannot be examined without removal of the label. In bad cases the wings may even touch the paper of the drawer, inviting worn fringes, mites, etc.

Here are some suggestions for the avoidance of the above faults:—

- (1) Obvious. Relax properly before attempting to set.
- (2) Inner margin of forewing should be square across board, and body lying straight in groove. Where the margin is not a straight line, it should still be set "as square as possible".
- (3) Obvious. Pin with the greatest care. It will make setting all the easier.
- (4) It is essential that the wings should lie perfectly flat on the board (before the setting-strip is applied) from base to apex. Pull pin up, or push it down, until this position is achieved.
- (5) Crossed pins above body, or below, or both.
- (6) Be sure that the moth is well relaxed: and use a setting-hook.
- (7) Easily corrected by pins in the groove.
- (8) Obvious: use a strip wide enough to cover the whole wing.
- (9) Pencil the date of setting below each moth, either on the setting-strip, or on a scrap of paper. Make it an **ABSOLUTE ROUTINE** to leave the moths on the boards for a definite number of days. Mine stay for 10 days: but the necessary period will, of course, depend on climate.
- (10) Be just as careful over removal as over setting. This fault is a very common one: especially perhaps among our younger enthusiasts.
- (11) I use a pinning-board, covered with different thicknesses of cork, forming a series of steps. The moth is laid on the appropriate step; largest ones on the

highest, smallest ones on the lowest; and the pin is pushed through until it meets the board below the cork.

And here are a few general remarks.

It cannot be too strongly emphasised that it is *impossible* to achieve good setting of a moth that is not thoroughly relaxed. Different workers test this condition in different ways. Myself, I gently pull at the forelegs with the setting-hook. If there is any resistance at all, the moth goes straight back to the relaxing jar.

The "setting-hook" referred to above is just a long entomological pin, with its point bent over, by means of fine forceps, to the minutest possible hook. The head of the pin is cut off, and the shank thrust into a wooden handle like a setting-needle. It is exceedingly useful for pulling legs, antennae, etc., into position. BUT it is advisable to paint its handle red: so that the hook will not be inadvertently picked up and used as a setting-needle—with dire results to the specimen under treatment.

Needle-holes in wings are, it seems, made more easily, and much bigger and more conspicuous, with a blunt needle than with a sharp one. So, keep a very fine-grained carborundum stone, and use it frequently. Further, when setting, hold the needle vertically, and not sloping. If the paper covering the setting-board is allowed to become rough, or very badly pitted with pin-holes, needle-holes and split wings will occur more easily. Unless (or until) a board is very bad, I find the following treatment useful. Sprinkle ordinary face-powder freely on the board, and "massage" it well, up and down, with the hand. It is remarkable how this will rejuvenate a well-used board. Shake and brush all loose power off before using the board. If the board is beyond this treatment, it must be well sandpapered and recovered—an easy process if the pasted paper is put on really wet. Boards will, naturally, last much longer if fine entomological pins are used for setting.

It has often been emphasised in this *Bulletin* that the data accompanying an insect are almost as valuable as the insect itself. Therefore, as soon as a moth is on the board, it is advisable to pin a label by it—either the one that will go on its pin in the cabinet, or one with a number referring to your notebook. When dealing with a number of moths, it is astonishingly easy to forget the particulars if they are left unrecorded until the moths come off the boards.

And now someone will ask, "And does every moth in your collection conform to your specification of perfect setting?" I don't think I had better answer that question. But I do my best.

A. L. H. TOWNSEND (1691).

COLIAS AUSTRALIS VERITY

Having seen the English name for *Colias australis* for the first time, in the September *Bulletin*, am I alone in thinking that a better name than "Berger's Clouded Yellow" could have been found?

The point is unimportant scientifically, but I should have preferred to see a more elegant name grace the pages of our future text-books.

A. SHOWLER (1442).

[The Editor agrees wholeheartedly. Could not there be a Committee set up by some authoritative body—the B.M. or the R.E.S.—to devise for the Lepidoptera pleasant English names when required and to establish by their authority all (or almost all) our present well-known English names? Such a Committee might suggest names for commoner species of other Orders and so encourage beginners. As the names would be English, there would be no need to deal with 'international' Rules and priorities.]

THE COLLECTOR IN INDUSTRIAL AREAS

Part 2

METHODS

All the usual methods may, of course, be tried out in towns and other built-up areas, with differing success, but, generally, some modifications of system are required. The following notes on the matter may assist

Light. Moths are attracted by light in cities as much as they are in the country but the conditions are very different and the poor collector finds himself confronted with the most amazing array of street-lamps, display signs, shops and house windows and a hundred other lights of every shade and brilliance, which make his own effort seem hopeless. Even if the moths were anxious to assist us in coming to our trap they would have the greatest difficulty in finding it! Nevertheless, the best moths are to be taken this way, indeed one of our town members has

recorded almost all our local species in this manner in three years.

The secret is in two parts. *First* you must pick the right night—look out for moths flying around street lamps or coming in at the window. If the activity is more than usual, prepare for an hour or two out of bed. At about 11 p.m. (when the majority of the other lights are put out) light up and you should have the best of the night before say 1 a.m. Incidentally, there is little point in fixing an elaborate light outside—an open door or window with a comfortable chair are just as effective until the moths really start arriving. This brings us to the *second* part—remember that the best moths do not always come right up to the light, they seem to like flying around a few feet away; therefore, have your net at "the ready" and take them as they fly near.

Sugar. Town woods and parks lack depth and sugaring is most often very disappointing. Even in more favourable parts it is always rather problematical. It should be used on suitable nights anywhere you have noted as being likely, though I cannot claim ever having had great success in these areas. One most interesting thing is worth recording, however. On one occasion, having obtained only three specimens from a whole evening with sugar in a local wood, I called to see an old collector and expressed my disappointment. With a little smile he got his lamp and took me out in his back yard—paved and only a few yards square. There were three sugar patches—one on his dust bin, one on the clothes post and one on the gate, and on each patch were quite a dozen moths, including several *Mormo maura* (The Old Lady) which I had never seen alive in the district before. He explained that every evening throughout the year, except in heavy frost and snow, he sugared these places and almost every night there were moths to be had. It was his theory that such patches became known to the moths—passed on from generation to generation in some way and that this was the reason of his success. Just how correct may be this theory I cannot say, but certainly the moths were there and that is the main thing.

Flowers. Little need be said about flowers except that if you have a small garden you can do no better than have a few large plants of red

valerian. A great number of the 'usuals' visit these blooms, which seem to continue throughout the summer, and occasionally you get a good thing. The thrill of seeing a great *Convolvulus Hawk* on your plant is never to be forgotten. I saw two which were so taken in the centre of Halifax a couple of years ago, and in my own collection are two which were similarly obtained in Huddersfield. If you have sufficient room a couple of *Buddleja* bushes will be a great asset both for moths by night and for butterflies by day. Something should be said of 'sallowings': this method I have found very satisfactory even in the town centre, wherever a good patch of willow is to be found. Mill yards are often excellent places, but our activities are, of course, somewhat unusual, and in such circumstances it is as well to obtain permission from owners before setting forth. Ivy is most disappointing, or so I have found, but even so it should always be visited when in full bloom, just in case.

Early stages. Collecting the earlier stages will be dealt with in later remarks on breeding and rearing.

W. E. COLLINSON (247).

(To be continued)

A NOTE ON THE SILVER CLOUD (*XYLOMYGES CONSPICILLARIS* L.)

I was interested to read Mr John Moore's note on the occurrence of the above-mentioned species in Gloucestershire and Worcestershire (*Bulletin No. 118*, p. 89). As is well known this species is locally common in the Taunton area of Somerset and is, in my experience, very easy to breed on *Lotus corniculatus* (Bird's-foot Trefoil). I do not think Mr Moore's tentative suggestion that the caterpillar may feed high up on oaks or elms is at all likely, in view of its tendency to roll itself up and fall to the ground when alarmed to the slightest extent. This habit is most noticeable when breeding the species in wooden breeding cages. The larvae frequently rest in numbers at the top of the cage and immediately the cage is touched almost all of them roll themselves up and fall heavily to the ground. Precisely the same thing happens if the larvae happen to be on the foodplant feeding when the cage is touched. It is therefore submitted that the larvae of this species in the wild state must feed on low-growing plants, as this

would enable them to return to their foodplant easily after falling to the ground.

C. S. H. BLATHWAYT (651).

MOSQUITO CONTROL

In *Bulletin No. 117*, p. 81, there appears an article on Mosquitoes and comments by Mr Classey. I have not studied this group but have a recent publication entitled *British Mosquitoes and how to exterminate them* by A. Moore Hogarth, which indicates that *Culex pipiens* attacks man, so contradicting Mr Classey's comments. Again, there would appear to be some sense in exterminating the males, if this could be done, as the females would not be much use without them.

ALAN M. MACLAURIN (1282).

It is true that one can find published statements that the Mosquito *Culex pipiens* L. does bite man. It may also be true that one can find published statements that the world is flat! However, things are not really as bad as all that; certainly the insect which is probably the cause of such statements is only with difficulty differentiated from *C. pipiens*; that insect being *Culex molestus* Forskål.

C. molestus is a very remarkable insect in many ways and, considering how closely allied it is to *C. pipiens*, differs most astoundingly from it in habits.

C. pipiens does **not** normally bite mammals but needs a blood-meal (usually avian) before it can lay fertile eggs; this species is usually the "substance" of the swarms mentioned by Mr P. G. Taylor in *Bulletin No. 117* of September 1950. (This, of course, is why it would be a waste of time and money to destroy swarms of males of *C. pipiens*).

C. molestus, on the other hand, does bite mammals, including man, most viciously—but (and, among mosquitoes, this is quite extraordinary) it can, and does, lay fertile eggs *without* taking a blood meal. Furthermore (and this, too, is unusual among mosquitoes) it can, and does, pair readily *without* "swarming."

In replying to Mr Taylor (*Bulletin No. 117*—as above) I did not go into this rather complicated explanation about these very closely allied species, but I am very glad that Mr MacLaurin has given me a chance to go a little more

deeply into it and, perhaps, to demonstrate a little more clearly just why it is a waste of time and money to start tackling problems such as the "Mosquito Nuisance" without having a very full knowledge of the biology, not only of mosquitoes in general, but of the actual species involved in any one place and at any one time.

I therefore quote the following *in extenso* from *The British Mosquitoes* by J. F. Marshall (B.M., 1938, price 20/-, still in print and a book I would recommend to anyone interested in the subject).

"The British records of *C. molestus* are as follows:—ENGLAND.—HANTS: Hayling Island (B.M.C. Institute, E/x/34). LONDON: Westminster (J. F. Marshall, F/vii/35). YORKS: Hull (Dr Gebbie, L/viii/35).

"It is important to note that the above three records of *C. molestus* are authenticated by the fact that, in each case, numerous generations have been reared by assembling male and female adults in small cages and providing them with an exclusively vegetarian diet.

It is probable that *C. molestus* is widely distributed in Britain; but the morphological and biological characteristics differentiating it from *C. pipiens* have hitherto been overlooked. As already mentioned, Shute has recorded cases of buildings in London (hotels in the Charing Cross district), Epsom, Harwich, Hull and Plumstead being seriously infested by man-biting females of '*C. pipiens*.' The fact that Hull has also provided one of the three 'authentic' British records of *C. molestus* is at least highly suggestive. In regard to the London records, moreover, Shute's 'biters' from Charing Cross and the 'authenticated *molestus*' ones from Westminster were collected within a mile of one another. It appears reasonable to suspect *C. molestus* of being the cause of annoyance, not only in the cases above specified, but also in similar cases which attract attention, from time to time, in other parts of the country." E. W. CLASSEY (41).

(E=eggs, F=female, L=larvae.—ED.)

FEEDING BEHAVIOUR OF *LESTES SPONSA* HANSEMANN

At 3.30 p.m. on August 19th, 1950, near Crewe, Cheshire, a male Damsel fly, *Lestes sponsa* Hansemann, was seen to leave a dead willow twig sticking out of a pond, make a quick flurry, and return to its resting place, apparently without catching anything. After a minute the performance was repeated, after another minute a slightly longer flight—lasting about three seconds—was made; on returning to its 'perch' the mandibles were seen to be moving—a capture had been made.

During the following twenty minutes notes were taken of the flights made, and the duration of each. A total of 18 flights was made, the duration varying from 1 to 3 seconds. After each flight the damselfly returned to the dead twig—though to different parts. On one occasion it perched on top of a broken end and held the abdomen horizontal for two minutes, on all other occasions it clung against an upright part of the twig, with the abdomen hanging down at a varying angle to the vertical (generally 30°-40°). When resting, the wings were held together over the abdomen—not half open as stated by Miss Longfield (1949, *The Dragonflies of the British Isles*, p. 179).

Three of the flights were attacks on flies that I could see, one of them on a fly passing behind the damselfly, though none was successful. On one occasion a fly passed about two feet away—the perch was left, but returned to after a very short flight—the fly had either gone from sight or had been recognised as unsuitable.

Unless the *L. sponsa* was catching something very small and the mandibles had finished their work before returning to the twig, nothing was caught during these 18 flights. On the 19th flight a small fly was captured. The damselfly was then taken and the thorax pinched to stun it.

On arriving home an attempt was made to dissect out the prey from the mandibles, but the fly was completely crushed, not even the wings, which would have given some clue to its family, could be found. The gut contents were even less informative, the exoskeletal fragments present being scarcely recognisable as insect parts.

J. GREEN (1044).

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1950/61 (2)

